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Steel Bookings Maintain Gain

October Business Keeps Well Ahead of September—Railroads Lead Renewed Buying and Bring Out Additional Large Inquiries for Cars and Motive Power—Further Tonnage for Japan Placed—Building Work Heavier

BUYING of steel continues in a rising volume and evidences of sound fundamental conditions grow more substantial and encouraging as October proceeds. Consumers are feeling their way and there are few urgent requests for material but the steady continuity of demand is impressive. The outstanding feature remains the return of the railroads to the market as large buyers of rolling stock and motive power and the past week has added important new negotiations of this character. The building and automobile situations are favorable with respect to present activity and future prospects and agricultural demand offers greater promise. Export orders are contributing considerably to new tonnage.

Bookings by steel companies generally in October show a good gain over September. With some large interests the tonnage this month to date is 20 per cent above September and 40 to 50 per cent above August. Steel corporation mills because of accustomed sales practice are booking at a better rate than the independent plants, and now are entering new business at substantially two-thirds of shipments with production at 88 to 90 per cent of ingot capacity.

Sheet bookings for all mills forged ahead sharply in September and were the heaviest since May. Independent producers representing 68.8 per cent of the country's capacity reported sales of 223,556 tons or 86.2 per cent of capacity. This represented a gain of 116,659 tons or 91.7 per cent over August.

Roads Want Equipment

Heavy inquiries for motive power this week are rounding out the large equipment buying program which the railroads apparently have renewed. Inquiries for 250 to 300 locomotives at least have appeared for the Southern Pacific, Missouri Pacific, Louisville & Nashville, Baltimore & Ohio, Pennsylvania and other roads. The Norfolk & Western has inquired for 3000 and the Louisville & Nashville for 2300 cars. An unnamed western road is about to inquire for 5000 cars. Car orders now being figured or immediately in sight exceed 25,000. New rail orders include 30,000 to 35,000 tons for the Missouri Pacific and 20,000 for the Reading.

IRON TRADE REVIEW composite of fourteen leading iron and steel products still reflects the falling pig iron market. This week it stands at $43.90 against $44.06 a week ago.

Building Is Livelier

Marking a generally enlivened inquiry for building steel, are the negotiations of the Ford Motor Co. for 15,000 tons of material for its proposed steelworks and finishing mills at Detroit. This company also recently took bids on 10,000 tons for an assembling plant at St. Paul. The railroads again are inquiring freely for bridge work 6000 tons or more having come out this week. A 10,000-ton power plant for the Public Service Corp. of New Jersey is planned. Building awards this week total 18,839 tons and inquiries 38,000 tons.

Pig iron prices have slipped again and are 50 cents to $1 lower. Buffalo competition down to $22 furnace for outside shipment continues an important factor over a wide area. Some southern sellers will do $20 Birmingham. The low stage of prices appears to be becoming more attractive to buyers for forward delivery and a number of inquiries for first quarter and first half have appeared. Some first quarter sales were made in lake territory this week on the same price basis as last quarter.

Japanese buying of steel especially in sheets is going ahead on a heavy basis. New York reports 15,000 to 20,000 tons of additional business in light gage black sheets closed this week. At Chicago 3000 tons of sheets and bars was placed this week. Japanese inquiries current call for 50,000 kegs of spikes and much miscellaneous material.

Ruhr Seeks Coke

Soaring prices for coke in Germany and France have directed large inquiries for furnace fuel to this country. Two cargoes, 5000 and 8000 tons respectively, for the Ruhr are about to be closed at Pittsburgh. German coke has been advanced this week to the equivalent of $13.62 per ton. The prevailing price on Connellsville furnace coke is $4, ovens.

A French producer has captured an order for 5500 tons of cast iron pipe for the city of Los Angeles for shipment by way of the Panama canal.

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Pig Iron Sags On Slack Buying

Prices off 50 Cents to $1 In Most Markets and Weak At All Points—Some First Quarter Buying Done But Most Sales for Spot Shipment—Plan Further Curtailment of Production—Better Inquiry Looms

PITTSBURGH, Oct. 16.—While in certain directions it would appear that the pig iron market had touched bottom, in others, more or less weakness still is shown. One large consumer has sounded out the foundry iron market and has developed a $23, valley, price from at least three sources which is 50 cents below last week's minimum. Other producers are selling small lot shipments at $23.50 to $24, valley, making the market quotable at $23 to $24 for the No. 2 grade (1.75 to 2.25 silicon). From $23 to $24, valley, is quoted on malleable with gray forge and No. 3 foundry now named at 50 cents under the prevailing levels on the No. 2 grade. A few large tonnages lately have been closed by users with their regular sources of supply and really are not a market factor. No large inquiries now are out on foundry, gray forge or malleable iron. Low phosphorus copper-free iron is selling in 50 to 100-ton lots at $30, valley, several lots of that size being closed this week in the face of severe competition offered by eastern furnaces. Interest in steelmaking iron has practically halted although on its inquiry for 500 tons of bessemer, the Allegheny Steel Co., bought 100 tons of resale at around $25, valley. One producer has sold 300 tons a month for the remainder of the year at $25.25, valley, while other valley producers continue to name the $25.50 figure on bessemer and $24 on basic. It is understood that some basic in the hands of middle interests is available at 50 cents to $1 per ton below that figure. Basic sales and inquiries are totally lacking.

Tonnage Appears in East

Boston, Oct. 16.—A mild buying movement in pig iron has broadened during the past week. While prices are soft and producers have been scrambling for business, considerable business has developed. One close observer estimates eastern Pennsylvania furnaces have booked 30,000 tons during the week. In New England sales have been heavier than for a month or more. A Massachusetts textile machine manufacturer took 1000 tons and other melters in Massachusetts and Connecticut took several lots ranging from 300 to 500 tons. Sales within the territory probably totaled 6000 or 8000 tons, divided between Buffalo and eastern Pennsylvania furnaces. Buffalo producers, with a freight handicap of $1.27, have been the more aggressive and in most every case have been willing to meet the delivered price of eastern Pennsylvania competition. Early in the week Pennsylvania furnaces dropped to $24 for No. 2X 2.25 to 2.75 silicon, and this was promptly met by $22.70, Buffalo, for the same grade. Later in the week eastern Pennsylvania furnaces offered to sell No. 2X at $23.50 at the furnace for lots of 500 tons or more and again these prices were met by Buffalo interests. At present there seems to be a tendency to hold to $23.50, but unless some eastern furnaces blow out soon lower prices will probably be made in an attempt to avoid storing iron.

A New Hampshire foundry is in the market for 300 tons of iron and a Rhode Island consumer wants from 500 to 1000 tons. Other inquiry of a less definite nature totals several thousand tons.

Eastern Inquiry Is Less

New York, Oct. 16.—Pig iron sales the past week aggregated about 7000 tons. Inquiry is somewhat smaller and the total does not aggregate more than 2000 tons. Eastern foundry iron continues to range from $23 to $23.50, base furnace, although concessions from this level may be had on sizable lots. The largest transaction during the past week involved 2500 tons of foundry for spot shipment to the Bayonne plant of the American Radiator Co. This went to an eastern Pennsylvania maker. In addition to former inquiry it is known that a number of consumers plan to buy, so that more activity is expected. The Buffalo market is regarded as around $23, base furnace, subject to concessions on attractive orders. Virginia foundry iron continues nominal at $25, base furnace. The National Radiator Co. is expected to close shortly for 1500 tons of foundry for its Johnstown plant.

Some Good Tonnages Placed

Buffalo, Oct. 16.—New inquiry for pig iron during the week is placed at 10,000 to 15,000 tons. One purchaser took 8500 tons of foundry and malleable. Another took 2000 to 3000 tons. Several lots of 1000 tons each are included in the inquiry and many for 500 tons. A 5000 ton inquiry for foundry iron which came from outside the district, was placed outside this district. The price is no stronger. Buyers seem to be able to place readily at $23 and it is understood that some iron was taken as low as $22.50 but under conditions peculiar to this particular case. Reports of as low as $22 done by a Buffalo furnace in New England, seem to be fairly authentic, but this price is not the going one. A large Buffalo interest which had taken the position that it was opposed to the present low prices is understood to have done $23.50 on some lots.

Cincinnati Prices Still Sag

Cincinnati, Oct. 16.—Pig iron prices continue to sag as a result of light buying. Activity is lowest of the year. Small lots for prompt delivery prevail, although this class of business has dwindled the past week. Sellers find orders specify immediate shipment, indicating stocks are unusually low.

It was reported here that the Standard Sanitary Mfg. Co., bought 1500 tons of northern iron for its Louisville plant for November-December. The business went to a lake furnace at a price said to be below $24, Ironton base. The Swain-Robinson Co., Richmond, Ind., also closed for 600 tons of northern iron for last and first quarter. Sales in this territory involve 50 to 100 tons for the most part and no sizable inquiries are pending. Dunham & Co., Berea, O., is in the market for 2000 to 2500 tons of northern iron, which represents its needs for first half. Owing to the small volume of business, it is difficult to judge the market. The southern market is featureless and while $21, Birmingham base, represents the majority of producers, $20 can be done with at least two furnaces on desirable tonnages.

The southern Ohio market ranges from $24 to $24.50, Ironton base, with the former quotation predominating. Despite the condition of the market, a number of southern Ohio furnaces which have been out of blast for several months, are being prepared to renew operation next month. The Jackson Iron & Steel Co. will put its stack in blast, while the Norton Iron Works will resume operations on bessemer iron. The Belfont Iron Works Co. also will put its stack in blast within two weeks. The Hanging Rock Iron Co., will blow out its stack before Nov. 1.

Sales Lower at Chicago

Chicago, Oct. 16.—While carload lots of pig iron command $26, Chicago furnace, larger lots for the past week have gone at $25.50. This price is weak and rumors of $25, furnace, for standard iron have been heard. The quotations appears representative at $25.50 to $26. Volume of sales is unchanged, with numerous lots of 200 to 300 tons. A Michigan melter has taken 500 tons of malleable and another has bought 550 tons of foundry iron. While shipments are in good volume melters are keeping stocks down to two or three weeks supply. Detroit automotive interests are inquiring for several thousand tons of malleable for first quarter. Apparently some southern iron is being offered at $20, Birmingham, and some off iron even lower. The quotations appear representative at $21, Birmingham. It is understood $26, furnace, equivalent to $29.04, delivered, Chicago, has been done on Lake Superior charcoal iron in small lots. This may be resale metal. The market appears to be $27, furnace. Several carloads of low phosphorus have been sold at $34 to $35, delivered. A sale of 8 per cent silvery has been made at $34.50, Jackson county.

On account of market conditions the Thomas stack at Milwaukee was blown out Oct. 10. Recently the stack

has been on low phosphorus. Stocks in the furnace yard are reported fair-sized.

Purchasing Is Light

St. Louis, Oct. 15.—Purchasing of pig iron is light and melters exhibit little interest. Recent weeks have witnessed a sharp decrease in orders for finished materials. This coupled with uncertainty as to prices, has served to disturb consumers and cause them to postpone covering other than immediate and well-defined requirements. Further price reductions bring quotations as low as $24, Chicago, and $20, Birmingham, on No. 2 foundry. One Tennessee producer undertook to initiate a selling campaign on a basis of $20, Birmingham, but failure of melters to respond to this reduction caused a return to the $21 base.

The leading local producer reports sales aggregating about 500 tons, including 300 tons to a stove maker. Other sellers report small lots up to 150 tons, aggregating under 1500 tons. Inquiries include 1000 tons of foundry by an Illinois melter and 500 tons of basic for shipment to the Northwest. Jobbing foundries complain of quietness, and most have reduced operations. Steel plants also have cut down their operations, and there is talk of further curtailment and actual closing down during the next three weeks, unless new business is obtained. An exception to the general rule is the stove industry, which is operating above 80 per cent capacity.

Furnaces in the several fields are disposed to meet competition on the small current business, and each deal is treated separately.

The range of quotations on southern iron is particularly broad, and barge and rail delivery injects a further element of uncertainty in the price situation.

Southern Market Still Lags

Birmingham, Ala., Oct. 15.—The pig iron market in the South shows no improvement. Sales are below production and though quotations are uncertain, furnace interests here insist that $24 per ton for No. 2 foundry is the base for southern sales, while competition in the Middle West is met with a $21 base and $20 is rumored. Southern furnaces have no inquiry for 1924 needs. Further curtailment of production is still intimated. It was generally understood that two more blast furnaces would be blown out this month. Present active furnaces number 21. Local melt of pig iron shows no sign of immediate improvement and a slight falling off is noted. Makers of pressure pipe, radiators and stoves are operating at capacity and all have a fair supply of iron on hand.

Inquire for First Quarter

Cleveland, Oct. 16.—Increased interest shown by buyers for pig iron for 1924 delivery is the feature of the market. Several definite inquiries for first quarter and for first half have come out and in a number of other cases buyers are quietly sounding out the situation and are considering the advisability of placing tonnage beyond Jan. 1. Furnaces are not urging such business but some

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Export Demand Aids Coke

Two Cargoes for Ruhr Being Negotiated—Domestic Users Hold Back —Furnace Inquiry Withdrawn—Market Listless and Lower

COKE PRICES, PAGE 1067

Pittsburgh, Oct. 16.—In a measure beehive coke demands from abroad are substituting for lack of domestic business. New York and Baltimore interests are distributing inquiries for at least two cargoes of 5000 and 8000 tons of standard blast furnace coke for the Ruhr district and these are to be closed this week. No inquiries are out from domestic blast furnaces and it is understood the Buffalo interest which inquired for 10,000 tons for November shipment has wtihdrawn the inquiry. The usual quotation on beehive blast furnace fuel is $4, although distress lots have appeared and are going as low as $3.75, ovens. Despite the further curtailment of production, considerable coke appears on track which has been disposed of at under $4. It is expected that within two weeks the market will manifest more strength because of the declining output and prices in advance of $4 will be obtainable. Smelters coke is fairly active. The Braden Copper Co. wants 6000 tons for shipment to South America to arrive Dec. 1. The International Nickel Co. today bought 200 carloads of medium sulphur coke at $3.40, ovens, closing on 100 carloads last week at a similar figure. Other medium sulphur or high sulphur coke or foundry coke cullings are available at $3 to $3.25. New demand for standard selected 72-hour foundry coke is rather limited although melting operations among foundries continue at a high rate as shown by the fact that they are taking in all the coke they have on contract and are using specifications regularly. Occasional small lots in the way of new business are sold at $4.75 to $5.25 although one small interest has been accepting a loss in taking $4.50 on foundry coke coming to it on a contract placed some time ago. Premium coke still sells at $7 to $7.25. Production according to the *Connellsville Courier* for the week ended Oct. 6 was 220,490 tons, as compared with 232,960 tons the preceding week.

Market Weak in East

New York, Oct. 16.—A listless condition characterizes the coke market. Consumers are not showing interest and there is some pressure to sell. As a result the market is weak. Standard beehive foundry coke for spot shipment is quoted from $4.75 to $5.25, Connellsville, although for certain brands as high as $6.50 continues to be asked. The Northern New Jersey by-product producer continues to quote $11.41, delivered at Newark and other northern New Jersey points, on standard foundry coke and has disposed of its 1923 output. Standard furnace coke now may be had at $4 to $4.25, Connellsville, while medium sulphur coke may be had as low as $3.25.

No Life at Cincinnati

Cincinnati, Oct. 16.—Demand for coke is considerably less than a week ago, and prices show further weakness. Domestic coke is exceedingly dull for this time of year, but dealers believe a revival will follow with colder weather. Connellsville coke is weakest. While the foundry grade is quoted at $5 to $5.50, ovens, some special brands have sold as high as $6.50, ovens, for prompt shipment, but the volume of sales on that basis has been comparatively small. New River foundry coke is the outstanding feature and while producers have comfortable orders they find new business scarce. Little Pocahontas coke is finding its way into this market. Sales of Wise County coke have been of small consequence, although a leading seller has placed 15 cars of foundry to a user in the Chicago territory for shipment in November and December. A user in Michigan is inquiring for 1500 tons of by-product furnace coke.

Sell Coke by Force

St. Louis, Oct. 15.—Coke is dull here. Buyers hold off or take only enough to last from week to week. Melters store little coke and domestic buying is considerably below normal for this season. Recent mild weather has tended further to depress the domestic trade, and low prices on bituminous coal are causing many former coke users to turn to the cheaper fuel. However, local by-product coke is holding firmly at $12.50 for foundry and $9.50 for domestic sizes. Accumulations at by-product ovens are growing rapidly. Connellsville coke is being freely offered here at lower prices, and fair quantities are being taken. The 72-hour product has sold at low as $4.75, with the better grades up to $6. Some cheap furnace coke has been purchased by industrial users, notably water gas interests. One Nebraska gas plant has engaged 2400 tons of this grade for shipment the rest of the year.

Market Dull in South

Birmingham, Ala., Oct. 15.—Coke in the Birmingham district is dull. Production is above demand and contracts are not sufficient to absorb the full output. However, there has been little stocking up so far. Local consumers are buying from hand to mouth. Quotations are weak, $7.50 being the top for foundry coke. All by-product coke oven plants are at full capacity, all but two supplying coke for blast furnaces and disposing of their other by-products on the market.

Crucible Steel Net Up

Earnings of the Crucible Steel Co., of America for the year ended Aug. 31, amounted to $6,783,493 compared with a deficit of $3,709,517 before dividends on both classes of stock in the previous fiscal year. After fixed charges there remained a balance of $5,302,243 for common and preferred stocks. The company's showing last year was the most favorable since 1920.

Pig Iron Buying Slack

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of them are receptive to it and at least one lot of 1500 tons for first quarter has been closed. The price basis for 1924 iron in this case and generally acceptable to the producers, is the same as that now prevailing for delivery during the remainder of the year. A Berea, O., consumer is one of those figuring on next year's tonnage, having inquiries for 2000 to 5000 tons for first quarter and first half. Most buyers continue to confine their interest in nearby iron to western territory. Iron piled this month is running at the rate of about 10 per cent of production.

Eastern Stacks Book Tonnage

Philadelphia, Oct. 16.—Demand for pig iron here continues of moderate proportions. Bookings for the past week have been small, but eastern furnaces have taken some tonnage from other districts. One maker, recently an aggressive seller, has booked sufficient to make propeots for the remainder of the year. Others are in the same condition as before and generally speaking furnaces could handle more orders. It is believed at least three eastern furnaces will blow

Engineering Board Meets at Rochester

At the meeting of the executive board of the Federated American Engineering societies held at Rochester, N. Y., Oct. 13, a number of resolutions were adopted pertaining to the status of the engineering profession in its relations with the government. Acaion was taken to launch a nation-wide movement to bring about the adoption by congress of that portion of the late President Harding's reorganization program which calls for

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Oct. 17, 1923	Sept. 1923	July 1923	Oct. 1922
PIG IRON				
Bessemer, valley del., Pitts....	$27.02	28.27	28.52	35.12
Basic, valley	24.00	25.00	25.15	30.60
Basic, eastern del., eastern Pa..	24.50	25.10	27.25	30.25
*No. 2 foundry, del. Pitts.....	24.77	26.52	27.37	33.62
*No. 2 foundry, Chicago.....	25.50	26.75	28.00	31.75
*Southern No. 2, Birmingham...	20.00	22.75	25.00	27.40
*Southern Ohio, No. 2, Ironton.	24.00	24.90	26.50	32.40
**No. 2X, Virginia furnace	25.50	25.50	27.25	33.00
**No. 2X, eastern del., Phila..	24.26	26.21	28.00	33.00
Malleable, valley	23.00	24.60	25.50	32.30
Malleable, Chicago	25.50	26.75	28.00	31.75
Lake Superior charcoal, Chicago	30.04	32.04	36.65	36.15
Gray forge, val. del. Pittsburgh	24.27	26.27	27.02	33.27
Ferromanganese, del. Pitts.....	111.79	114.79	122.29	105.47
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh.	42.50	42.50	42.50	39.85
Sheet bars, open-hearth, Pitts....	42.50	42.50	42.50	39.85
Billets, bessemer, Pittsburgh ...	41.50	42.50	42.50	40.00
Billets, open-hearth, Pittsburgh..	41.50	42.50	42.50	40.00
FINISHED MATERIAL				
Steel bars, Pittsburgh.....	2.40	2.40	2.40	2.00
Steel bars, Chicago.....	2.50	2.50	2.50	2.00
Steel bars, Philadelphia.....	2.72	2.72	2.72	2.325

	Oct. 17, 1923	Sept. 1923	July 1923	Oct. 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia.....	$2.67	2.72	2.72	2.325
Iron bars, Chicago mills.....	2.40	2.38	2.55	2.50
Beams, Pittsburgh.....	2.50	2.50	2.50	2.00
Beams, Philadelphia	2.72	2.82	2.82	2.325
Beams, Chicago	2.60	2.60	2.60	2.10
Tank plates, Pittsburgh.....	2.50	2.50	2.50	2.05
Tank plates, Philadelphia	2.77	2.82	2.82	2.425
Tank plates, Chicago.....	2.60	2.60	2.60	2.10
Sheets, blk., No. 28, Pittsburgh.	3.75	3.75	3.85	3.50
Sheets, blue anl., No. 10, Pitts.	3.00	3.00	3.00	2.60
Sheets, galv., No. 28, Pittsburgh.	5.00	5.00	5.00	4.50
Wire nails, Pittsburgh.....	3.00	3.00	3.00	2.70
COKE				
Connellsville furnace	3.75	4.55	4.35	10.60
Connellsville foundry, ovens.....	4.75	5.70	5.15	12.10
OLD MATERIAL				
Heavy melting steel, Pittsburgh.	16.00	18.00	18.25	21.35
Heavy melting steel, eastern Pa.	15.00	16.85	17.25	18.00
Heavy melting steel, Chicago....	14.50	16.55	17.10	18.50
No. 1 wrought, eastern Pa....	17.75	19.00	18.85	22.50
No. 1 wrought, Chicago.....	15.25	18.25	16.60	20.40
Rails for rolling, Chicago.....	16.00	18.30	18.40	20.50

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago

Oct. 17, 1923	Oct. 10, 1923	September, 1923	July, 1923	October, 1922	October, 1913
$43.90	$44.06	$44.64	$45.39	$43.60	$24.91

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

fill out their requirements for the next 30 to 60 days. Miscellaneous tonnage of this sort being placed continues of fair volume, one interest booking 7000 or 8000 tons in the week and others about the same amount. Outside competition has forced a further reduction of 50 cents in the price of Cleveland producers which now stands at $24, furnace, or approximately $24.50, for local Cleveland delivery. Lower prices sometimes are made for outside shipment to equalize with the competition of those interests which are low sellers at the present time. Shipments by the furnaces against contract are heavy, particularly in malleable. Although a little iron still is being piled, apparently this situation has about reached a balance in central

out next month. Prices are unchanged at $23, base furnaces, plus 50-cent silicon differentials, which seems the minimum, on most attractive orders, while some carload business is bringing as high as $24, base. Little business of a character to test the market is coming out. The largest inquiry is from a Baltimore consumer, calling for 1000 tons of foundry. Low phosphorus inquiries aggregate about 1000 tons, with sales of about 200 tons. Copper bearing low-phosphorus continues at $28, furnace, with copper free unchanged at $30 to $31, delivered, Philadelphia.

The Consolidated Gas & Gasolene Engine Co., manufacturer and seller of gas engines, 33 Park Place, New York, has filed a petition in bankruptcy with liabilities $120,220 and assets $140,049.

making over the department of interior.

The executive board decided to call a general conference on the national department of public works in conjunction with the annual meeting of the American Engineering council to be held at Washington in January 1924. The board also adopted a resolution prepared by its reforestation committee, the purpose of which is to foster co-operation between the federal government and the various states in respect to a forest policy. A resolution was expressed that Dean Mortimer E. Cooley is forced by ill health to relinquish the presidency of the federation. Dean Cooley's successor will be elected at the annual meeting of the council in Washington early in January.

Iron and Steel Prices

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Pig Iron

Prices per gross ton

Bessemer, valley	$25.00 to 25.50
Bessemer, Pittsburgh	27.02 to 27.27
Basic, valley	24.00
Basic, Pittsburgh	25.77
Basic, Buffalo	23.00
Basic, del., eastern Pa.	24.50 to 25.00
Malleable, valley	23.00 to 24.00
Malleable, Pittsburgh	24.77 to 25.77
Malleable, Chicago	25.50 to 26.00
Malleable, Buffalo	22.50 to 23.00
Malleable, del., eastern Pa.	25.25 to 26.25

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	24.76 to 25.76
No. 1X, Buffalo	23.50
No. 2 foundry, valley	23.00 to 24.00
No. 2 foundry, Pittsburgh	24.77 to 25.77
No. 2 foundry, Buffalo	22.50 to 23.00
No. 2 foundry, Chicago	25.50 to 26.00
No. 2 foundry, Granite City	26.50 to 27.50
No. 2 foundry, Ironton fur.	24.00
No. 2 foundry, Cleveland, del.	24.50
No. 2 foundry, del., Phila.	23.76 to 24.76
No. 2 foundry, N. J. tidewater	24.50 to 25.50
No. 2X, eastern del., Phila.	24.26 to 25.26
No. 2X, east. N. J. tidewater	25.00 to 26.00
No. 2X, eastern del. Boston	27.15 to 27.65
No. 2X foundry, Buffalo fur.	23.00
No. 2X, Buffalo, del. Boston	27.17 to 27.67
No. 2 southern, Birmingham	20.00 to 21.00
No. 2 southern, Cincinnati	24.05 to 25.05
No. 2 southern, Chicago	26.01 to 27.01
No. 2 southern, Philadelphia	27.80 to 28.80
No. 2 southern, Cleveland	26.01 to 27.01
No. 2 southern, Boston (rail and water)	26.91 to 27.91
No. 2 southern, St. Louis	25.17 to 26.17
No. 2X, Virginia furnace	25.00 to 25.50
No. 2X, Virginia, Phila.	30.27 to 30.77
No. 2X, Virginia, Jersey City	30.54 to 31.04
No. 2X, Virginia, Boston	31.42 to 31.92
Gray forge, eastern Pa.	24.00
Gray forge, val. del., Pitts.	24.27 to 24.77
Low phos., standard, valley	30.00 to 31.00
Low phos., standard, Phila.	30.00
Low phos., Lebanon, furnace	28.00
†Low phos. English, delivered Phila. territory	29.26 to 30.64
Charcoal, Birmingham	32.00 to 33.00
Charcoal, Superior, Chicago	30.04

Silvery Iron

Jackson County, Ohio, furnace

7 to 8 per cent.	$33.00
8 to 9 per cent.	34.50
9 to 10 per cent.	36.50
10 to 11 per cent.	38.50
11 to 12 per cent.	41.00
12 per cent	43.50

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent.	$43.50
11 to 12 per cent.	46.00
12 to 13 per cent.	48.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$107.00 to 117.50
Ferromanganese, delivered, Pittsburgh	111.75 to 122.29
Spiegeleisen 19 to 21 per cent furnace or tidewater	40.00 to 47.00
Ferrosilicon, 50 per cent contract freight allowed	80.00 to 82.50
Ferrotungsten standard, per pound contained	88.00 to 90.00
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	nominal
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.50
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

†Duty paid.

Coke

Beehive, Ovens

Prices per net ton

Connellsville furnace	$3.75 to 4.00
Connellsville foundry	4.75 to 5.25
New River Furnace	8.00 to 9.00
New River foundry	11.50 to 12.00
Wise county furnace	5.50 to 6.00
Wise county foundry	6.00 to 6.50
Alabama furnace	6.50 to 7.00
Alabama foundry	7.25 to 7.50

By-Product

Foundry, Newark, N. J., del.	$11.41
Foundry, Chicago, ovens	13.50
Foundry, Boston, delivered	13.50
Foundry, Granite City, Ill.	13.00
Foundry, Alabama	7.25 to 7.50

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$40.00 to 42.50
Open-hearth, Youngstown	40.00 to 42.50
Open-hearth, Philadelphia	46.67 to 47.67
Bessemer, Pittsburgh	40.00 to 42.50
Bessemer, Youngstown	40.00 to 42.50
Forging, Pittsburgh	47.50
Forging, Philadelphia	51.67 to 52.67

SHEET BARS

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50

SLABS

Pittsburgh	$40.00 to $42.50
Youngstown	40.00 to 42.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh, $51.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $8 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.40c
Universal skelp, Pittsburgh	2.40c
Sheared skelp, Pittsburgh	2.40c

Shapes, Plates and Bars

Prices per pound

Structural shapes, Pittsburgh	2.50c
Structural shapes, Phila.	2.67c to 2.82c
Structural shapes, New York	2.69c to 2.84c
Structural shapes, Chicago	2.60c
Tank plates, Pittsburgh	2.50c
Tank plates, Philadelphia	2.72c to 2.82c
Tank plates, New York	2.74c to 2.84c
Tank plates, Chicago	2.60c
Bars, soft steel, Pittsburgh	2.40c
Bars, soft steel, Philadelphia	2.72c
Bars, soft steel, New York	2.74c
Bars, soft steel, Chicago	2.50c
Bars, refined iron, Pittsburgh	3.25c to 5.00c
Bars, rail steel, Chicago	2.30c
Bars, rail steel, mill	2.15c to 2.35c
Reinforcing bars, billet, Pitts.	2.40c
Bar iron, common, Phila.	2.67c to 2.72c
Bar iron, common, New York	2.69c to 2.74c
Bar iron, common, Chicago	2.40c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Prices per pound

Hoops, Pittsburgh, under 5 in.	3.00c to 3.15c
Hoops, Pittsburgh, 20 gage, under 1 in.	3.30c
Bands, Pittsburgh	3.00c to 3.15c
Cold finished steel bars, Pittsburgh base	3.00c to 3.25c
Steel shafting, Pittsburgh	3.00c to 3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.64

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	30.00 to 35.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.15c to 2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.50c
Spikes, boat and barge, Pitts.	3.50c
Spikes, railroad, Chicago	3.25c
Track bolts, Pitts. Standard	4.00c
Track bolts, Pitts., small	4.75c to 5.00c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c
Tie plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Prices per pound

Wire nails, Pittsburgh	3.00c
Galv'd nails, 1-inch and over	5.25c
Plain wire, Pittsburgh	2.75c
Annealed wire, Pittsburgh	2.90c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c
Barbed wire, painted, Pitts.	3.45c
Barbed wire, galv., Pitts.	3.80c
Polished staples Pittsburgh	3.45c
Galvanized staples Pittsburgh	3.80c
Coated nails, count keg, Pittsburgh	2.60c to 2.70c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Prices per pound

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburgh stamping quality	3.00c to 3.15c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	5.00c

Sheets

SHEET MILL BLACK

Prices per pound

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	4.07c to 4.17c
No. 28, open-hearth, Chicago	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, open-hearth, Chicago	3.84c

GALVANIZED

No. 28, open-hearth, Pitts.	4.90c to 5.00c
No. 28 bessemer, Pittsburgh	4.90c to 5.00c
No. 28, open-hearth, Phila.	5.32c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c
No. 10 bessemer, Pittsburgh	3.00c
No. 10, open-hearth, Phila.	3.32c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c

Tin Plate

Prices per 100-pound box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	63.20 to 65.20
Six-inch and over, Chicago	58.20 to 60.20
Three-inch, Birmingham	59.00 to 60.00
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	68.60
Six-inch and over, New York	63.60

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Scrap Decline Is General

Consumers Buy Little, Offering Less than Market, While Railroad Offerings Are Large—Storing Unsorted Tonnage

SCRAP PRICES, PAGE 1136

Chicago, Oct. 16.—With further reductions of 50 cents to $1.50 per ton scrap iron and steel prices are approaching a nominal status. What little buying is being done is of an emergency nature. Melters continue to take their contract obligations and rejections are rare. Dealers are hopeful railroads will buy equipment in the volume projected, believing this will be reflected in their market. Some scrap dealers are storing mixed scrap deferring its sorting. The Rock Island railroad has a list of 4500 tons, the Wabash two lists aggregating 3935 tons, the Chicago Great Western 900 tons and the Soo Line 700 tons.

Demand Fair for Cast

Boston, Oct. 16.—Steel mill grades of scrap declined further during the past week and the only real activity continues in cast grades. Tonnage of cast scrap originating in this district is far below that of steel mill scrap, and inactivity in steel grades consequently is more pronounced. Heavy melting steel for shipment to Pennsylvania does not command over $11.50 per gross ton, shipping point, and as dealers refuse to sell at this price, practically no tonnage has moved. One exception is a few hundred tons taken by the American Steel & Wire Co., Worcester, Mass., at about $12.50, shipping point. Stove plate has sold at $17. Strictly textile machinery scrap has been placed at $23.50, delivered. Other sales of No. 1 machinery went at $22.50. Altogether it is estimated that from 1000 to 1500 tons of cast scrap changed hands during the week.

Small Trade in East

New York, Oct. 16.—Another dull week has prevailed in the scrap market, with decline in several grades. Especially pronounced is weakness in borings and turnings, for which demand is lacking. Mixed borings and turnings hold at $7 to $7.50, New York; turnings, $7 to $7.50; and clean cast borings, $8.50 to $9.50, although trading is so small as to make prices largely nominal. Heavy melting and No. 1 railroad have dropped off $1, dealers quoting $11 to $11.50, New York, on the former and $12 to $12.50 on the latter. The better grades of steel are going in limited quantities to Bethlehem, Conshohocken and Pottsville, Pa., at $15, delivered. Wrought pipe has been marked down to a range of $10.50 to $11. Cast scrap is weak, but nominally unchanged.

Lacks Support of Consumers

Pittsburgh, Oct. 16.—The scrap market lacks support by consumers. A user at Weirton, W. Va., has been buying in 1000 or 2000-ton quantities for several weeks, starting heavy melting steel at $17.50, going to $17, and finally its bid has reached $16. So far dealers have been unable to purchased at $15.50 to cover short orders taken at $16. Hence heavy melting steel remains quotable at $16 to $16.25. This interest bid on hydraulic pressed sheets at around $16 and after buying a small quantity dropped its bid by successive stages to $14 or $14.50, while on bundled sheets it is offering $13. The Midland, Pa., interest has bought small lots but no orders are out for Monessen, Woodlawn, Butler or Brackenridge, Pa. Steel axles are quoted at $19 to $19.50, a decline of 50 cents, while low-phosphorus billet and bloom crops are down $1, as is railroad malleable. Some rerolling mills have bought rails for rerolling into concrete bars, there being no market for light rails. For this they have paid $17.50 to $18 but are offering only $17 now. The Norfolk & Western railroad is taking bids on about 30,000 tons, including approximately 15,000 tons of mixed scrap.

Market Is Demoralized

Detroit, Oct. 16.—The iron and steel scrap market is demoralized in this section and dealers and yardmen declare it is in the worst condition that they have seen for years. Embargoes at Toledo and at points in the valley have added to the depressing situation. Consumers refuse to make bids for scrap and offers of dealers are declined daily even at the declines noted.

Most prices although down 50 cents at the outset of this week are nominal. Producers in this section are accumulating large supplies.

Better Buying, Prices Same

Philadelphia, Oct. 16.—Good buying of scrap during the past week, compared with past weeks has not served to bring about higher prices. In fact, prices are considerably lower, declines of 50 cents to $1 per ton being registered.

Cincinnati Goes Lower

Cincinnati, Oct. 16.—Price declines in iron and steel scrap continue. The market is lifeless and even dealers have discontinued purchasing. Prices now quoted are nominal, with the probability that no tonnage could be sold at their level. Some heavy consumers have stopped shipments throwing material back on dealers' hands. Railroads continue to offer large tonnages and this and light buying cause weakness. A consumer at Chattanooga, Tenn., offered a dealer, $16, delivered, for railroad malleable, which was turned down because it would have brought the price to $12, Cincinnati, $2 under cost. Railroad scrap is being absorbed by dealers to fill out contracts or to lay down for speculative purposes, although this class of buying is not so apparent as a month ago. The Norfolk & Western railroad will close a list aggregating about 35,000 tons this week.

Think Market Bottom Reached

Cleveland, Oct. 16.—Iron and steel scrap prices in the Cleveland district continue to sag. Little buying is being done beyond the circle of dealers finding it necessary to cover on contracts. Others confine activities to picking up bargain tonnage to lay down on yards in anticipation of higher prices. Consuming demand does not extend beyond absolute needs although many users are taking all the scrap offered on contract. One prominent steelmaker has raised an embargo effective during the past several weeks and is absorbing considerable tonnage, more in fact than had been expected. Markdown of prices, affecting practically the entire list, within the past week has ranged from 75 cents to $2 a ton, dealers apparently making an effort to tempt consumers with what they regard as attractive offers. Heavy melting steel heretofore selling at $15.50 to $15.75 now is quoted at $14.75 to $15.25; machine shop turnings down from $12 to $12.25 to $11 to $11.25; cast borings down from $12.50 to $13 to $11.50 to $12; hydraulic compressed sheets from $13.75 to $14 to $13 to $13.25; bundled sheets from $11.75 to $12.25 to $11 to $11.25; No. 1 cast from $21.50 to $22 to $20 to $21; stove plate from $16 to $16.50 to $15 to $15.50;

(*Concluded on Page* 1082)

Resale Offerings

Absorb Limited Sales Being Made in Ferroalloys—Prices Unchanged

FERROALLOY PRICES, PAGE 1067

New York, Oct. 16.—Resale transactions continue to comprise the only business in the ferromanganese market. Several carloads were sold at resale during the past week at $108 duty paid tidewater. Resale tonnages are less easily obtained but there still seems to be sufficient resale material in the market to take care of present requirements. No business has developed from the recent sizable inquiries aggregating about 1000 tons. Firsthand prices continue to range from $110 to $117.50 duty paid tidewater.

The spiegeleisen market continues to be quoted at $40 to $47.50 furnace for 20 per cent metal, depending on the seller and on the quantity involved. The New Jersey Zinc Co. is about to blow in its second furnace at Palmerton, Pa., making two furnaces of this interest active on spiegeleisen, which represents its usual operation.

Alloy steel manufacturers are operating at a high rate, some important plants producing at 95 per cent of capacity. This work appears to be in departments other than high speed steel, which is in rather light demand, with stocks of finished steel rather heavy. The tungsten market is slow, reflecting the lack of snap in all branches of the trade. Prices for ferrotungsten are unchanged at 88 to 90 cents a pound contained; powder, $1; wolframite, $8.25 a short ton unit. The movement of ferrochrome from manufacturers to alloy steel makers are double this month the amount shipped in August. This is a contract business and the price of the 4 to 6 per cent carbon grade is unchanged at 12 cents a pound contained. Prices of 50 per cent ferrosilicon are steady at $82.50 to $85, delivered. Vanadium shipments are heavy on good orders booked early in the month, with prices unchanged at $3.50 base for the open-hearth

grade and $4 a pound contained for the tool steel grade.

Demand Grows Duller

Pittsburgh, Oct. 16.—Ferroalloys undoubtedly are duller this week than they have been in some time past. Outside of a few single carload sales of ferromanganese the market is practically without feature. A second consumer has closed a small tonnage for delivery over the first quarter of 1924. Two or three straight carload orders have been placed during the past week. The price situation is a trifle stronger and domestic producers are maintaining the $110 base figure since resale material has disappeared from the market. No new inquiries of size are out for ferromanganese and users of other ferroalloys such as vanadium, tungsten, chrome or silicon are not buying nor are they asking quotations.

Spiegeleisen sales are confined to single carloads although with an increase in rail business in the East, larger inquiries as well as orders are in prospect from the rail producers. One large spiegeleisen maker is maintaining $44 and $45 prices on 16 to 19 per cent and 19 to 21 per cent material, respectively, while the Dunbar, Pa., producer is quoting $41 to $45 f.o.b. furnace, depending upon the quantity involved.

Alloy Sales Are Lacking

Chicago, Oct. 16.—Some small lots of ferromanganese have been made at $110, seaboard. With resale material disposed of more strength is evident in speigeleisen at $46, but there is no activity. Ferrosilicon is nominal at $85 to $90, delivered but no sales have been made.

Wire Output Holds

Nails Most in Demand—Deliveries Move Back—Demand From Japan

WIRE PRICES, PAGE 1067

Pittsburgh, Oct. 16.—Wire and wire nail mills continue to operate at 75 to 80 per cent of capacity, mostly on wire nails. Some plants are able to offer six to eight weeks' delivery on small nails, 2-inch and under, while deliveries of larger nails run four to six weeks. Orders for plain, galvanized or barbed wire, have been fairly numerous but individual lots are small. Considerable nail and galvanized wire business is pending from Japan, several orders already having been placed. Nail orders for Japan call for 2000 to 10,000 kegs at a time and are being handled through New York exporting houses. Mixed carload orders for domestic users involve a large aggregate tonnage of each product, including some fencing. Wire and nails remain firm at 2.75c and 3.00c, base Pittsburgh. Cement coated nails are quoted at 2.60c to 2.70c, base Pittsburgh, some concessions of 5 or 10 cents being encountered.

Inventory Time Approaches

Chicago, Oct. 16.—With inventory time approaching with the urge to keep stocks down, jobbers are restricting their buying of wire to immediate requirements. These, however, apparently are slightly heavier and a perceptible increase in buying is seen. Prices are unchanged.

Semifinished Sales Few

Consumers Well Covered for Present Needs—Japanese Inquiries for Sheet Bars Reported—Price Fairly Firm

SHEET PRICES, PAGE 1067

Pittsburgh, Oct. 16.—Several tentative sheet bar inquiries and a few requests for slab prices are the features of the week's semifinished market. Sheet bars are wanted for conversion into sheets to meet the demands of Japan for reconstruction purposes. Some of the sheet mills which have received the inquiry, put out at the request of the Japanese government for 60,000 tons of sheets, are endeavoring to line up sheet bars before they state definitely what they will be able to do. So far no prices below $42.50, Pittsburgh or Youngstown, have been developed. At least two inquiries for slabs involving lots below 5000 tons each are current. Most makers are quoting $42.50 on these although it is understood that $40 still is available in certain directions on both slabs and billets. A small lot of billets have sold this past week at $42.50, Pittsburgh, but it is intimated that the $40 figure would still apply on large attractive orders. Some wire rods continue to be sought for conversion into nails, galvanized wire, etc., for Japan. Wire rods are quoted at $51, base. Large tonnage requirements of skelp might bring out lower figures but inquiries are not appearing and the untested price is 2.40c, base Pittsburgh.

Billet Prices Are Untested

Philadelphia, Oct. 16.—Billet inquiry the past week has been small and no sales of note have been made. As a results prices are untested and nomiral. In view of postponements recently it is expected action will be taken soon in a number of cases and a fair buying movement in billets will be done shortly.

Sheet Bars Show Firmness

Youngstown, O., Oct. 16.—Fourth quarter prices on sheet bars, billets and slabs continues to be maintained at $42.50, Youngstown. No sales of billets or slabs are current this week. The bulk of the tonnage moving is sheet bars for which contracts were placed a few weeks ago. A contract forwarded to a consumer a few weeks ago for his signature was returned this week for execution typifing in a measure the firmness of the going quotation. Consumers who purchase sheet bars from local producers are specifying in quantities sufficient to keep semifinished capacity engaged.

Japan Seeks Sheet Bars

Cleveland, Oct. 16.—Japan, it is reported, is in the market for a considerable tonnage of sheet bars for conversion into light sheets but no business of this character has appeared in this district. Consumers are specifying for light weight sheet bars against contracts for semifinished material which, considering the heavy Japanese demand for this class of product, is taken to mean that these consumers have received large orders from that source. Little new business in semifinished steel is being placed but demand against contracts is well sustained and local makers are shipping at practically capacity production. Prices have developed no changes.

Orders Still Are Large from Warehouses

WAREHOUSE PRICES, PAGE 1128

Detroit, Oct. 16.—Movement of iron and steel from warehouse continues liberal with prices showing no change. Despite weakness in some lines prices are holding as they have for the past few months. No large individual tonnage is being sought, but the aggregate of orders each week shows an increase. New buying from plants which previously had placed their requirements with mills are now turning to warehouses for supplies. This is an indication that these plants using bars and bands and some structural shapes are operating on a narrow basis with the approach of the first of the year and the inventory season. Mills are able to make deliveries more readily than a short time back and many consumers of bars and sheets are turning to them for requirements rather than to the jobbers. In view of limited buying business this fall has held up surprisingly well.

Business Continues Brisk

New York, Oct. 16.—Jobbers report a continued brisk business, affecting most descriptions. As has been the case for some time, galvanized and blue annealed sheets are weak, although no further shading has been reported. Prices are steady all down the list. A leading jobber states that business so far this month has been at a better rate than in September. While Japanese inquiry is current, little of that business has been placed with the warehouses.

Market Further Improved

Philadelphia, Oct. 16.—Demand for iron and steel from stock continues to reflect further improvement here, with business during the past week averaging from 75 to 80 per cent of normal. Prices are unchanged.

Demand Still Strong

Cleveland, Oct. 16.—Iron and steel warehouse business during the past week maintained the strength which it gained recently, with a falling off in demand for but few items. Some shading still is rumored, but outside of fluctuations in sheets little price cutting is definitely noted. Building demands continue strong. Much of the unloading prevalent last month is completed and the market gains strength as inventories are steadied.

Opens New Bar Mill

Alliance Steel Corp., 332 South Michigan avenue, Chicago, has opened a new mill for the manufacture of various open-hearth and bessemer bar products. Capacity for producing special shapes also is provided.

Bar Demand Grows Better

Japanese Tonnage Must Take Turn in Western Mills—Bookings Less Than Shipments but Nearby Sales at Premium

BAR PRICES, PAGE 1067

Chicago, Oct. 16.—Due largely to the influx of Japanese business a round tonnage of bars is before the market. For spot delivery a fancy price could be exacted but it seems likely most of the business placed will be for forward delivery. Inland Steel Co. has taken a small tonnage. Domestic inquiry and bookings of bars have developed momentum since Oct. 1 and while orders still do not equal shipments, makers are gratified. Large railroad orders for equipment will stimulate business and industrial buyers are expected to follow the lead of the carriers. The soft steel bar price is unchanged at 2.50c, Chicago.

Both in bar iron and in rail steel bars improvement is noted. Users still are buying on a hand-to-mouth basis but in the past week requirements have increased. Makers of bar iron insist that 2.40c, Chicago mill, is their minimum. Rail steel bars still are quoted at 2.30c, mill. The backlog of the Moline mill, which resumed operations a few days ago, has slightly lengthened. Business in bars reflects the general increase in inquiry and orders which has been evident since Oct. 1.

Near Future Needs Specified

Pittsburgh, Oct. 16.—Merchant steel bar buyers are not specifying liberally since their orders are confined to prompt material. A few who have bought fourth quarter requirements are specifying at the September rate and the underlying condition is considered strong because the aggregate tonnage consumed each month is high. The price is a trifle stronger, inasmuch as some orders for last quarter have been taken at 2.40c, base Pittsburgh. Buffalo makers have taken orders at 2.40c, mill, which figures back to around 2.30c, Pittsburgh, and some eastern makers have quoted similarly. Others in the east have named 2.30c, base Pittsburgh, but this has been on large tonnages only and the occasion has been rare, since practically all buying has been in small lots. Inclination to meet this competition arises only in connection with exceedingly large lots. Refined iron bars are unchanged at 3.25c to 5.00c, base Pittsburgh. There is a slight improvement in demand, with a few fair sized orders placed.

October Tonnage Grows

Cleveland, Oct. 16.—October bookings by representative sales offices in this district show fair increase in October compared with September and a considerable part of this is in bars. Requirements to piece out production programs are accountable for most of this tonnage for there is no buying for extended delivery. The present easy condition of shipments, three to four weeks in many sizes unless particularly urgent, makes buyers indifferent to closing tonnage very far ahead. Automobile builders in this territory are expected to soon place additional round tonnages for November delivery in view of increases to their production schedules which they now are about to put into effect. The Willys-Overland Co. is one of these. Merchant bar prices are very steady at 2.40c, Pittsburgh. Reports of sharp concessions to large automobile builders in the Detroit district prove to be unfounded. However, light hoops where they get into strip competition, are being shaded to below 3.00c, Pittsburgh. Cold-rolled bars also are subject to some softness at a range of 3.00c to 3.25c, Pittsburgh.

Buying Is Hand-to-Mouth

Boston, Oct. 16.—Fourth quarter bar contracts in New England develop slowly. Hand-to-mouth buying continues without much change in volume. A leading interest finds a 15 per cent drop in sales during the week but with other producers conditions are unchanged. Prices range from 2.40c to 2.50c, Pittsburgh.

Cold Drawn Sales Fair

Pittsburgh, Oct. 16.—Incoming business in cold drawn steel bars is described at "comfortable." New orders are at a lower rate than shipments, and backlogs are disappearing. Shipments are at 70 per cent while new business is no higher than 60 per cent. Since consumption is being maintained at an even higher rate, customers taking in material previously ordered, and no stocks are being accumulated, a large demand is being dammed up against the future. It is expected that this will break some time in the early winter. Despite the hunger for business in certain directions, no price concessions below the 3.00c minimum have appeared and the market remains quotable at 3.00c to 3.25c, base Pittsburgh. The lower figure has been made in competition on attractive specifications.

Specifications Come Better

Philadelphia, Oct. 16.—Specifications and new business in soft steel bars are somewhat better but not nearly equal to shipments. Order books continue well filled and the market is firmly maintained at 2.40c, Pittsburgh, equvalent to 2.72c, delivered Philadelphia.

Nut, Bolt, Rivet Buying Less Than Output

NUT AND BOLT PRICES, PAGE 1132

Pittsburgh, Oct. 16.—With a continuation of buying nuts, bolts and rivets, in small lots this market displays no outstanding features. During the last few days the aggregate of small orders has been large but makers claim it still is short of what it should be at this season. Single carloads and sometimes slightly larger lots are bought and orders of that character are attractive to makers with small backlogs. Hence competition still is keen and concessions of an extra 5 or 10 per cent have been made, depending upon the tonnage. Jobbers continue to buy sparingly, as they stocked up well in September. Nut, bolt and rivet plants are operating on an average of 75 per cent of capacity. With structural rivets at 2.75c, Pittsburgh, little is left for conversion costs. It is claimed that when bars are priced at 2.40c the rivet price should be at least 3.40c minimum, the cost of conversion being one cent per pound. Rivet orders are mostly for small lots although occasionally carload lots are noted.

Railroads Buy Most Bolts

Cleveland, Oct. 16.—Quotations on bolts and nuts are steady at the established levels and the demand generally continues on a par with that of last week. Specifications against contracts are of satisfactory size while new bookings are fair. Railroads continue to be the heaviest buyers although jobbers are ordering to some extent. Cold-punched nuts now are being quoted 50 and 10 off, whereas they formerly were 50, 10 and 5 off.

Rivet prices continue weak and a base quotation as low as 2.75c, Pittsburgh, continues to be heard. Demand is exceedingly dull and little new business is developing. The leading maker is booking some fourth quarter business at 3.00c, Pittsburgh, which price it refuses to shade in view or the limited tonnages in the market. This interest reports it is operating at a fair rate.

Some Improvement Evident

Chicago, Oct. 16.—Bolt and nut users continue to delay, but a slight improvement is evident. The prospects are that buying for the remainder of the quarter will continue on a spot basis.

Railroads Buy Bolt Needs

Pittsburgh, Oct. 16.—While bolt, nut and rivet demand continues fair it is insufficient to maintain the market. Current rivet prices continue to range from 2.85c to 3.25c, base Pittsburgh, depending on the atractiveness of the order. The biggest business now in the market involves the monthly requirements of bolts, nuts, rivets and track spikes of some of the eastern railroads.

Hoop Orders Only Fair

HOOP PRICES, PAGE 1067

Pittsburgh, Oct. 16.—With only fair business on books, hoop and band makers are not receving new orders at the rate desired or expected. Coopers for the most part have well balanced stocks for fall demand. Automotive interests and stamping concerns are buying only small lots. The price is unchanged at 3.00c to 3.15c, base Pittsburgh.

Buy Nearby Strip Needs

STRIP PRICES, PAGE 1067

Pittsburgh, Oct. 16.—As in other lines, hot and cold-rolled strip steel buying does not involve distant shipping dates and is confined to nearby requirements. Practically no specifications are for shipment after Nov. 30. A few users have specified November needs but most have yet to place these. Numerous inquiries are out and the outlook is bright although buying to be done from now on probably will be

for first quarter, since the inventory season approaches.

Prices on hot strip are stronger but the market still is quotable at 3.00c to 3.15c, base Pittsburgh. On extremely narrow and light gages, as much as 3.30c is obtainable. Cold-rolled is firm at 5.00c, base Pittsburgh. Operations average between 75 and 80 per cent of capacity, even with some plants on the 8-hour day basis running only two turns.

Indian Ore Offered

New York, Oct. 16.—Indian manganese ore has been offered at 40 cents per unit, c.i.f. tidewater for shipment over the first five months of next year but very little interest has been aroused. The 40-cent price may be taken as representing the nominal market on Indian and Brazilian ore. The market on Caucasian washed ore containing 53 to 55 per cent manganese continues at 41 to 42 cents, c.i.f. tidewater

September Tonnage Drops

United States Steel Corp. unfilled bookings as of Sept. 30, totaling 5,035,750 tons continued the decline started in April. Bookings at the close of September were 378,913 tons below the unfilled bookings of Aug. 1 which were 5,414,663 tons, showing a decline of 6.99 per cent. This is the smallest per cent decline since May 31, when the decrease in unfilled bookings was 4.21 per cent. The August decline was 8.4 per cent and that of July 7.4 per cent. Unfilled bookings on Sept. 1 were the lowest since March 31, 1922. The total at that time was only 4,494,148.

Date	Total	Change, tonnage	Change, per cent	
Sept. 30, 1923....	5,035,750	378,913—	6.99	—
Aug. 31, 1923....	5,414,663	496,100—	8.4	—
July 31, 1923....	5,910,763	475,498—	7.4	—
June 30, 1923....	6,386,261	595,090—	8.5	—
May 31, 1923....	6,981,351	307,158—	4.21	—
Apr. 30, 1923....	7,288,509	114,823—	1.5	—
Mar. 31, 1923....	7,403,332	119,343+	1.63	+
Feb. 28, 1923....	7,283,989	373,213+	5.40	+
Jan. 31, 1923....	6,910,776	165,073+	2.31	+
Dec. 31, 1922....	6,745,703	94,539—	1.39	—
Nov. 30, 1922....	6,840,242	62.045—	.89	—
Oct. 31, 1922....	6,902,287	210,680+	3.14	+
Sept. 30, 1922....	6,691,607	741,502+	12.4	+
Aug. 31, 1922....	5,950,105	173,944+	3.01	+
July 31, 1922....	5,776,161	140,630+	2.48	+
June 30, 1922....	5,635,531	381,303+	7.2	+
May 31, 1922....	5,254,228	157,311+	3.08	+
April 30, 1922....	5,096,917	602,769+	13.4	+
Mar. 31, 1922....	4,494,148	353,079+	8.5	+
Feb. 28, 1922....	4,141,069	100,609—	2.307	—
Jan. 31, 1922....	4,241,678	26,736—	0.0062	—
Dec. 31, 1921....	4,268,414	17,872+	0.004	+
Nov. 30, 1921....	4,250,542	36,287—	0.84	—
Oct. 31, 1921....	4,286,829	273,841—	6.004	—
Sept. 30, 1921....	4,560,670	28,744+	0.63	+

Locomotives Shipped

Washington, Oct. 16.—Domestic exports of steam and electric locomotives from the United States in August totaled 40 pieces, 27 being steam, 12 electric railway and one electric industrial engine. Six steam engines were shipped to Japan, seven to Canada, four to Brazil and four to Dutch Guiana, the other countries taking but one or two each. Eight electric railway locomotives were exported to Chile, three to Japan and one to Mexico while the only industrial electric locomotive which was shipped went to British South Africa.

Plate Tonnage Gains

Cars, Locomotives and Other Requirements Afford Mills Better Prospects—Eight Vessels Placed in East—Tankage Pending

PLATE PRICES, PAGE 1067

New York, Oct. 16.—Liveliest interest in the plate market here concerns itself with prospective large purchases of car material. A number of eastern roads have car orders under negotiation. It is not yet definitely known just how many cars are going to be placed by individual roads; in fact, no decisions have been made. It is believed likely that the New York Central will place about 25,000 cars, the Pennsylvania about 12,000 to 15,000 and the Baltimore & Ohio certainly 1500 but probably as many as 5000. This business, in addition to the large car orders under negotiation by western roads, is definitely in sight and it is expected that much of it will be placed within the next two to four weeks. In view of the tremendous tonnage involved, it is expected that the placing of the business will have the effect of tightening up the plate supply, at least with the larger companies.

In other lines of plates consumption, the current business is small. The only oil tank inquiry of any size has come from the Navy department which wants prices on two 60,000-barrel tanks for Mare Island; for these two tanks about 550 tons of plates will be required. Other tank work now in the market is of an unimportant character. No new shipbuilding developments have transpired. The inquiries for two vessels for the Clyde line, two for the Old Dominion line and one for the Southern Pacific have not been closed; while these inquiries are still considered as live ones, nobody has any idea as to when they will be placed. All of the large makers continue to quote 2.50c, base Pittsburgh, on plates but smaller eastern mills still name 2.40c on attractive lots.

Round Tonnage Before Market

Chicago, Oct. 16.—Japanese inquiry for reconstruction material includes some plates but Chicago makers are confronted with rolling schedules well into the new year and this business may wait. The expected 30,000 tons of plates for oil storage tanks has not yet materialized, but a steady stream of small tank business is coming out. The extensive railroad program will doubtless engage Chicago district makers a good way into the first half of 1924. The plate price remains 2.60c, Chicago mill.

Inquiries Moderate in Size

Pittsburgh, Oct. 16.—Moderate sized inquiries alone are coming out for plates, no generally advertised tank work or other forms of fabricated plates being in circulation at the present. The unusual inquiry calls for 1000 tons; the usual one involves lots below that figure, 200, 300 or possibly 500 tons at a time. The Pittsburgh-Des Moines Steel Co. was awarded a grain elevator and storage bin for the Bisbee Linseed Oil Co., Philadelphia, 300 tons, mostly plates. Several railroads want elevated tanks as well as other small plate and structural shape jobs, several of which have been placed with independent fabricators here. One inquiry being figured on calls for three tanks of 50,000-gallon capacity for a local manufacturer but the total tonnage of plates involved is below 100. A few oil tanks are asked for, for the mid-continent field and reports in Texas are to the effect that two or three live prospects are in touch with tank builders. The plate price is unchanged here at 2.50c, base Pittsburgh, although some lower prices are named in other sections where a mill basis is used.

Revive Large Orders

Philadelphia, Oct. 16.—Revival of large negotiations for locomotives by the railroads is the commanding development of the market situation so far as it affects steel plates. Pending locomotive orders exceed 250 and include several of the leading systems. From 12 000 to 15,000 tons of plates is involved in this business. General plate business in the East is somewhat improved but the volume continues less than shipments. The tone of prices is firmer and leading makers are refusing to sell under 2.50c, Pittsburgh in most cases. Occasionally sales, however, continue to be made at 2.40c, Pittsburgh, equivalent to 2.72c, Philadelphia. An important piece of business just placed involves eight vessels for the Standard Transportation Co., five of which have been placed with the Sun Shipbuilding Corp. and three with the New York Shipbuilding Co. The steel requirements, about 6500 tons, will be furnished by the Carnegie Steel Co.

Prices Are Not Shaded

Cleveland, Oct. 16.—Recent reports published elsewhere than in IRON TRADE REVIEW of price concessions having been granted by Cleveland mills in connection with the tonnage of plates for the Big Four railroad, proved to be unfounded. The business in question, about 700 tons for last quarter, has been placed at 2.50c, Pittsburgh with full freight of 31 cents to destination, near Indianapolis. This delivered prices is equivalent to 2.53c, Cleveland, at which figure it was placed, the railroad taking delivery at Cleveland instead of at final destination. No deviations from the 2.50c, Pittsburgh, price can be established and the market has every appearance of firmness. Odd lot demand for plates continues to improve, some sellers reporting the best orders this week since June. Boiler manufacturers have been placing some tonnage. Generally, however, tonnage lots are not very numerous. A round total was represented by pending lake ship contracts and about 4000 tons of steel, mostly plates, will be required for a large number of repairs which the Lake Erie railroad has in contemplation. Deliveries are comparatively easy but not so much so in plates as in other finished products.

The Penn Seaboard Steel Co., Philadelphia, for several months ended July reports gross sales amounted to $2,541,917. Cost of sales $2,347,658. Profits $194,259; other income $13,137, net income $59,819.

Concrete Awards Larger

Unusually Active Building Season Continues To Take Heavy Tonnages of Reinforcing Bars—Pacific Coast Lettings Are Numerous

REINFORCING BAR PRICES, PAGE 1067

Cleveland, Oct. 16.—Heavy tonnages of reinforcing bars are pending in this district, the outstanding item being that of 2000 tons for Baldwin filtration work, bids on which go in Oct. 24. Other items on which bids are in or asked aggregate a total of 1000 tons. Inquiries for small lots continue in a large number with some dealers reporting better demand than for months past. The only award of size was 150 tons for sewage disposal plant at Euclid Village, O., to Paterson-Leitch Co. Weakness in rerolled bar prices has strengthened the competition between those merchants and new steel bar dealers. Warehouse billet steel bars continue firm at 2.75c, Pittsburgh, on a strong mill price of 2.40c, Pittsburgh. Rerolled bars may now be had at 2.15c, mill, on favorable tonnages although 2.20c to 2.25c is generally quoted.

Attractive Business Pending

New York, Oct. 16.—Occasional lots of odds and ends continue to be sold in concrete reinforcing bars at lower than 2.40c, base Pittsburgh, but this figure appears to be minimum in all cases where plain carbon bars rolled from new material are involved. The volume of business generally continues small, although there are a number of attractive lots pending.

Market Has Dull Tone

Pittsburgh, Oct. 16.—Dullness continues to be noted in the concrete bar market. Inquiries are not numerous and awards are few. On Oct. 21 the Pittsburgh board of education will meet to award the Boggs avenue elementary school and the South Hills high school jobs, involving a total of approximately 350 tons. The Truscon Steel Co., was successful in obtaining the award of the office building for the Appalachian Power Co., Bluefield, W. Va., 120 tons. The Bethlehem Steel Co., Cambria Steel Co. division, probably will furnish the 120 tons required for the Napoleon street bridge, Johnstown, Pa., contract for which was awarded the Farris Engineering Co., Pittsburgh. Concrete bar prices are unchanged at 2.40c, base Pittsburgh.

Award 400-Ton Contract

Cincinnati, Oct. 16.—Relatively unimportant tonnages are for the most part involved in concrete bar transactions which have come to the closing point this past week. The Ferro Construction Co., Cincinnati, has been awarded the Rauh-Mack Shirt Co.'s addition in this city which will take 400 tons. The construction company will buy about 40 tons, filling the balance of the order from its stock. Other awards run from 25 to 50 tons each.

Small Jobs Still Predominate

Chicago, Oct. 16.—Reinforcing concrete bar business is holding up well and showing much less than the usual seasonal decline. Small jobs of from 25 to 50 tons are numerous, while jobs of 100 tons or more are less frequent. All bar interests assert that 2.75c, Chicago warehouse, continues the governing price.

CONCRETE CONTRACTS PLACED

Awards this week	8,831 tons
Awards last week	2,015 tons
Awards two weeks ago	3,485 tons

1160 tons, Ashley river bridge, Charlestown, S. C., to Concrete Steel Co.
700 tons, apartment house, Sixth and Carondelet streets, Los Angeles, to Truscon Steel Co.
600 tons, Howard Buick Auto Co. building, Fifteenth and Figuero streets, Los Angeles, to Geo. L. Eastman Co.
500 tons, office building, Eighth, Spring and Main streets, Los Angeles, to unknown fabricator.
400 tons, addition to Rauh-Mack Shirt Co., Cincinnati, to Ferro Construction Co.
372 tons, Federal Trust building, Hollywood, Cal., to Geo. L. Eastman Co.
313 tons, warehouse for Dohrmann Commercial Co., Los Angeles, to Truscon Steel Co.
300 tons, 14-story office building, Seventh and Los Angeles streets, Los Angeles, to unknown fabricator.
250 tons, Skirvin hotel, Oklahoma City, Okla., to Capitol Steel & Iron Co.
250 tons, Piper hotel Madison, Wis., to Kalman Steel Co.
250 tons, Elks memorial, Chicago, to Corrugated Bar Co.
250 tons, Paden building, Hill street between Seventh and Eighth streets, Los Angeles, to unknown fabricator.
220 tons, Ross garage, Long Beach, Cal., to Geo. L. Eastman Co.
220 tons, building for Los Angeles Rubber Co., 1500 South Los Angeles street, Los Angeles, to Geo. L. Eastman Co.
200 tons, addition Mercantile Arcade building, Los Angeles, to unknown fabricator.
200 tons, warehouse for Los Angeles Warehouse Co., San Pedro and Commercial streets, Los Angeles, to unknown fabricator.
200 tons, New York Central bridges and other work at Castleton, N. Y., to Concrete Steel Co.
200 tons, Pequabuck river bridge, Bridgeport, Conn., to Kalman Steel Co.
200 tons, Illinois state highways, to Kalman Steel Co.
152 tons, John C. Fremont school, Los Angeles, to Truscon Steel Co.
150 tons, Illinois state bridge work, to Kalman Steel Co.
150 tons, sewer disposal work at Euclid village, Ohio, to Paterson-Leitch Co.
150 tons, 6-story loft building, Sixth street between Grand and Hope streets, Los Angeles, to Truscon Steel Co.
140 tons, Chancelor-Lyons building, Fifteenth and Grand streets, Los Angeles, to Badt-Falk Co.
140 tons, additions to Linwood, Wheeler and Columbus schools, Oklahoma City, Okla., through Gross Construction Co., to Capitol Steel & Iron Co.
139 tons, John R. Richardson building, Sixth and Lebanon streets, Los Angeles, to Geo. L. Eastman Co.
130 tons, additions to the Wilson, Whittier and Shields Heights schools, Oklahoma City, Okla., through Campbell & Price, to Capitol Steel & Iron Co.
120 tons, office building for Appalachian Power Co., Bluefield, W. Va., to Truscon Steel Co.
115 tons, road work and bridges in Pittsburgh county, Okla., to Capitol Steel & Iron Co.
110 tons, Farmers National Bank building, Oklahoma City, Okla., to Capitol Steel & Iron Co.
100 tons, school building, Newark, N. J., to Truscon Steel Co.
100 tons, naval training station, San Diego, Cal., to Truscon Steel Co.
100 tons, factory for Marrel Co., Willow street, Los Angeles, to Geo. L. Eastman Co.
100 tons, City hospital, Long Beach, Cal., to Truscon Steel Co.
100 tons, Redman fireproof storage warehouse, Santa Monica, Cal., to Truscon Steel Co.
100 tons, road work and bridges in Noble county, Oklahoma, to Capitol Steel & Iron Co.
100 tons, road work and bridges for Latimer county, Oklahoma, through E. L. Terry, Wilburton, Okla., to Capitol Steel Co. & Iron Co.
100 tons, Westwood and Lee schools, Oklahoma City, Okla., to Capitol Steel & Iron Co.

CONCRETE CONTRACTS PENDING

900 tons, News Publishing Co. building, New York; general contract let to Turner Construction Co.
700 to 800 tons, McCormick road, Chicago; bids in.
600 tons, warehouse for port commission, Norfolk, Va.; bids being taken on general contract.
500 tons, footings for legislative building, state of Washington; Sound Construction & Engineering Co. general contractor.
450 tons, office building for Taft Realty Co., Hollywood, Cal.; bids being received.
320 tons, warehouse for Wm. Voelker Furniture Co., 2307 East Seventh street, Los Angeles; Clinton Construction Co. general contractor.
300 tons, proposed addition to Schroth Packing Co. plant, Cincinnati; temporarily abandoned.
300 tons, Pacific Southwest Trust & Savings Bank building, Pasadena, Cal., general contractor, Schofield Engineering Co.
250 tons, Otis Elevator Co. factory, San Francisco; bids in.
223 tons, part time high school, Los Angeles; bids in.
200 tons, building for Western Custume Co., Broadway between Ninth and Tenth streets, Los Angeles; bids being taken.
175 tons, Capitol theatre, Chicago; bids in.
120 tons, Napoleon street bridge, Johnstown, Pa.; general contract awarded Farris Engineering Co., Pittsburgh; steel will probably be furnished by Bethlehem Steel Co.
100 tons, factory for Crescent Creamery Co., Los Angeles; Milsap Co. general contractor.
100 tons, Lake street sub-station of Commonweath Edison Co.; bids in.
Tonnage not stated, addition to Naval Y. M. C. A., 5-story building, Bremerton, Wash. Steel to be bought in New York.
Tonnage not stated, Elks club building, Astoria, Oreg.; pending.

Pipe Mills

Still Are Besieged with Requests for Larger Sized Tonnages

PIPE PRICES, PAGE 1067 AND 1132

Pittsburgh, Oct. 16.—Tonnage backlogs among tubular goods producers still are heavy and the shipping rate is high since demands from jobbers for stocks or for work under way are numerous and exacting. Little new business is coming to light but building activity is at its height and requests upon the mills for a large aggregate tonnage of standard full weight merchant pipe in butt-weld sizes are unrelenting. The oil country goods market is sustained by increased demand for gas pipe, operators in Pennsylvania, West Virginia, Ohio and Kentucky paying more attention to gas than to oil. A few tentative inquiries are current for distant points for line pipe and other oil goods.

Prices Are Unchanged

New York, Oct. 16.—Fresh demand for cast iron pipe is comprised chiefly of small tonnages, with the situation generally unchanged. An outstanding item is the lot of 5000 tons for the department of water, gas and electricity, previously noted as pending and on which bids go in Oct. 17. While not showing the strength of two or three weeks ago prices are unchanged.

The Dutch Shell Co. has placed an order with the National Tube Co. for 8000 tons of boring tubes.

Let 1200-Ton County Job

Cleveland, Oct. 16.—Award of the 1200-ton lot of cast iron pipe for work in Lake county was made to

the United States Cast Iron Pipe & Foundry Co. The order consisted of 10,000 feet of 12-inch pipe and the remainder divided among 6, 8 and 10-inch sizes. A tonnage of fittings was also let.

Premiums Have Almost Disappeared

Chicago, Oct. 16.—Much small business in cast iron pipe is coming from the West and orders of two to three carloads are numerous. Except for one maker, no premiums are reported being paid for immediate delivery. This is due more to the seasonal recession than to any noticeable diminution of business on the books of makers. The buying now being done is largely of a fill-in character. It is estimated that about 2000 tons will be required for work in Tulsa, Okla., where bids will be opened Oct. 26.

Awards Smallest in Weeks

Birmingham, Ala., Oct. 15.—Cast iron pipe lettings last week aggregated the smallest tonnage in weeks. An order for 4000 tons of cast iron pipe at Los Angeles, was lost to United States manufacturers during the week and awarded to a French manufacturer of cast iron pipe. This pipe will be made at Pont-a-Mausson, France, and shipped to Los Angeles through the Panama canal. No change in quotations is noted although for some time past, large tonnages have been commanding concessions. All plants are operating at capacity. The National Cast Iron Pipe Co. will have all four of its DeLavaud machines for the manufacture of centrifugal pipe in operation this month.

CAST IRON PIPE PLACED

5500 tons, 4, 6, 8 and 12-inch pipe for Los Angeles, awarded to Pacific Pipe & Supply Co., Los Angeles, for Pont-a-Mousson, France.

515 tons, 6 and 16 class B pipe for San Diego, Cal., to United States Cast Iron Pipe & Foundry Co.

CAST IRON PIPE PENDING

2000 tons, work in Tulsa, Okla.; bids in Oct. 26.

500 tons, 6, 4 and 24-inch class B and C pipe for Los Angeles; National Cast Iron Pipe Co. low bidder.

Tin Plate Orders

For 1924 Held in Abeyance Awaiting Naming of Prices

TIN PLATE PRICES, PAGE 1067

Pittsburgh, Oct. 16.—Tin plate buyers are well covered to the end of the year and while some have indicated what their early 1924 desires are to be, prices not yet have been announced for the first quarter and orders for delivery in that period are accordingly held in abeyance. Some container manufacturers would buy more for delivery this year if they could get it from their regular connections but most producers are filled up to capacity. An occasional inquiry develops from abroad but this is no more than usual. Shipments are heavy and backlogs fast are being reduced. The American Sheet & Tin Plate Co. was able to increase its operating basis to 89 per cent this past week and the average among independents is sustained.

Japanese Placing Sheets

Export Demand Absorbing Nearby Tonnage in Certain Gages—Prompt Delivery Becoming Scarce In All Markets

SEMIFINISHED STEEL PRICES, PAGE 1067

Pittsburgh, Oct. 16.—Unsolicited specifications and a fair total of new business in various grades of sheets coming to the American Sheet & Tin Plate Co., involve a large aggregate tonnage at full market prices. These are taken at its own delivery dates, usually six to eight weeks. Where prompt delivery is required, the orders go to independent sheet makers most of whom are able to offer a reasonably prompt shipment, some within two weeks. Because the situation is so easy, individual orders do not involve large tonnages. Consumption continues heavy and sheet fabrication at a high rate is insured for many weeks. Additional lots up to 3000 tons have been placed for export to Japan. The requirement of 50,000 or 60,000 tons, put out by the Japanese government will probably be placed piecemeal through New York exporting houses. The American company was able to increase production to 89 per cent of capacity the past week and may sustain or exceed this mark during the present week. Other plants are operating 80 per cent or lower the general average among independents being no higher than 70 or 75 per cent. The price situation is unchanged, concessions continuing on black sheets down to 3.75c and occasional concessions below the 5.00c base price on galvanized. Blue annealed is firm at 3.00c, with 5.35c base, applying in connection with full-finished automobile sheets.

Building Takes Sheets

Boston, Oct. 16.—An improvement in orders for sheets during the past week contrasts with low sheet sales during the last five or six weeks. Demand is largely from manufacturers who serve the building trades. One of the principal orders is for single pass sheets for stamped ceilings. Galvanized sheets are in improved demand and the tone of the whole sheet market is cheerful. Prices are unchanged.

Some Shading in East

Philadelphia, Oct. 16.—Blue annealed sheets continue strong and mills not only continue operating full but new business is coming in slightly less volume than shipments. Continuation of operation for the remainder of the year at capacity appears assured. Blue annealed is firm at 3c, Pittsburgh, equivalent to 3.32c, delivered Philadelphia. Most makers continue 3.85c, Pittsburgh for black sheets, although occasional sales are made at 3.75c, Pittsburgh. Galvanized continues generally at 5c, Pittsburgh, with occasional sales at 4.90c.

Shade Black For Tonnage

Youngstown, O., Oct. 16.—Sheet business continues to be placed at the full prices of 3.00c for blue annealed, 3.85c for black and 5.00c for galvanized, although tonnage does not assume large proportions. The price of 3.75c on black continues to be made by certain producers whose rates of operation range from 35 to 50 per cent, so that the situation seemingly is a test of salesmanship.

Additional Japanese business has been placed and according to rumors about 150,000 tons of various grades of common sheets are expected to be placed by Japan during this quarter. Stocks in the hands of several producers have become unbalanced due to consumers taking advantage of attractive prices in numerous lists in circulation during the past six weeks. Whether this has had much effect in slowing down operations is a matter of conjecture. Buyers continue to look for bargains and business reflects the conservative policy which became apparent late in last quarter. Operations are at 62 per cent of capacity, a loss of 2 per cent compared with the rate one week ago.

High grade sheets are quoted at 5.35c for No. 22 gage, Pittsburgh, and while comfortable tonnage already is in hand for fourth quarter new business has slowed up perceptibly.

Japanese Business Before Market

Chicago, Oct. 16.—Eastern makers apparently having become gorged with Japanese sheet business, the overflow is being felt at Chicago. The Inland Steel Co. has taken 3000 tons of black and galvanized sheets and bars, with the bars only a minority of the tonnage. Makers report a round tonnage sought but state they cannot handle it except for forward delivery. Business now on books will keep them engaged for 30 to 45 days into the new year. Premiums for immediate delivery could be obtained. Some of the Japanese business is not considered attractive, inasmuch as it calls for sheets 30 to 36 inches wide and from 7 to 8 feet long. Prices are unchanged at 3c, Pittsburgh for blue, 3.85c for black and 5c for galvanized.

Plans Tin Can Plant

Erection of a tin can factory at Marietta, O., is contemplated by W. F. Robertson, president of W. F. Robertson Steel & Iron Co., Cincinnati, in conjunction with a group of eastern business interests. The plant probably will be built adjoining the mill of the Hudson Sheet & Tin Plate Co., which was purchased two months ago by Mr. Robertson. It is the plan of Mr. Robertson and his associates to manufacture in addition to ordinary tin cans, lithograph sheets for the making of tobacco containers.

It was pointed out by Mr. Robertson that bars for the manufacture of sheets can be bought cheaper at Marietta than at Pittsburgh and that this would be an inducement for locating the can factory at that point. The company also would get a more uniform freight rate to points in the Middle West. Mr. Robertson expects to reach a definite arrangement before the end of this month.

Shape Awards Growing

Inquiry for 15,000 Tons for Steel Plant at River Rouge for Ford Interests Features Market—Lettings Are Larger

STRUCTURAL SHAPE PRICES, PAGE 1067

Chicago, Oct. 16.—While some reluctance to place large structural contracts is in evidence, smaller jobs continue to come out in good number and their aggregate is sizable. Fabricating shops continue booked up three to four months and the outlook is that business will continue at slightly above the seasonal level. In Chicago the maintenance of building is shown by the fact that a reliable authority predicts that October 1923, building permits will top those of last October by $5,000,000. In the first ten days of this month permits totaled $6,500,000, against $14,000,000 for all October, 1922. An award is expected shortly in New York of the 2200 tons required for the Twin branch power house at Mishawaka, Ind. The Kansas City Bridge Co. is understood to be low bidder for 1100 tons for South Dakota bridge work, but an award has not yet been made. The plain shape price still is 2.60c, Chicago.

Inquiries More Numerous

Cincinnati, Oct. 16.—Inquiries for structural shapes for various small jobs in this and nearby vicinities are more numerous although large awards, recently have been few and far between. All fabricators report receipt of a fair number of small 50 to 100-ton contracts, and state that many of the larger projects are still pending. The Louisville & Nashville railroad is in the market for 1000 tons to repair a number of its bridges between Cincinnati and Nashville, Tenn. The Big Four railroad, will receive bids shortly on 800 tons of bridge material. The quotation on shapes continues at 3.50c to 3.60c, Cincinnati.

Larger Tonnages Appear

Boston, Oct. 16.—Appearance of several round tonnage jobs during the past week helped to give the structural market in New England a more cheerful aspect. Steel companies report improvement in orders for small tonnages and architects report plans for heavy building programs throughout the first half of 1924. During the past week fabricators received plans for new work totaling 10,000 tons or more. Much of this tonnage is of a confidential nature. One lot is for 3000 tons and another for a theater taking 2000 tons. Bids are being taken for an addition to the Weymouth, Mass., power plant which will take 500 tons. Prices on large work for definite delivery are firm at 2.50c, Pittsburgh, but 50 to 75-ton jobs are being freely taken at 2.40c by three of the smaller eastern steel mills.

Apartment Work Features Demand

New York, Oct. 16.—Apartment house work continues a feature of the local structural shape market, with close to 2000 tons now said to be under active negotiation. Included in other work contemplated for the relatively near future is a power plant for the Public Service Corp., Newark, on which plans are now virtually completed and which will involve approximately 10,000 tons. Plans for the proposed building of the American Telephone & Telegraph Co., to be erected here will likely be completed within a month, but bids may not be asked until some time later. Preliminary estimates place the steel involved in this job at approximately 16,000 tons.

Buying the past week has involved few tonnages of importance. Nevertheless, the three leading mills supplying plain material in this district continue to quote 2.50c, base Pittsburgh. Mill shipments range around six to eight weeks on tonnages of assorted specifications.

Ford interests are reported to have entered the market for 15,000 tons of shapes for a steel plant and finishing mills at River Rouge, Mich. In addition, that company recently has taken bids for 10,000 tons for an assembly plant at St. Paul, Minn.

Marked Improvement Noted

Philadelphia, Oct. 16.—Plain structural shape business during the past week showed a marked improvement. Many lots which had been held up were placed. Bookings during the week exceeded shipments and indications are that considerably more business is coming out. The market is unchanged in price, with most eastern business continuing to go at 2.50c, base Pittsburgh, equivalent to 2.82c, Philadelphia, with 2.40c, and 2.35c, Pittsburgh, being named on occasional exceptional tonnages.

Local Market Still is Quiet

Pittsburgh, Oct. 16.—Locally the structural shape market is quiet, only small jobs being figured. New inquiries involving 25 to 50-ton lots are numerous; larger jobs are rare. Additional information about the Oil City, Pa., bridge is not forthcoming although W. S. Rae, here was low bidder, and was awarded the general contract. About 1500 tons of steel are involved. The Coopersdale bridge at Johnstown, Pa., was awarded to the Independent Bridge Co., which involves about 200 tons. Prices are unchanged at 2.50c, base Pittsburgh, although some 2.40c prices are current in other directions, some of the eastern mills quoting for eastern delivery a price equivalent to 2.40c, base Pittsburgh.

Activity Continues To Increase

Cleveland, Oct. 16.—Structural shape activity in this district continues to increase, with larger tonnages being brought out. Indicative of requirements of railroads in this district was the report of one fabricator of receiving inquiries for 5000 tons in two days, these coming from the Louisville & Nashville, Big Four, Pennsylvania, Baltimore & Ohio, and the Kanawha & West Virginia. Much work is up, with bids asked or in on 7500 tons, outstanding of which is the Brotherhood of Locomotive Engineers bank building, Cleveland, requiring about 5000 tons. Bids are in on the 10,000 tons needed for the Ford Motor Co., assembling plant at St. Paul, Minn. Among the awards of the week were those of 2000 tons for the Detriot Institute of Art, to an unknown fabricator, 500-tons for the Wheeling & Lake Erie railroad bridge at Massillon, O., and 1950 tons for several hospitals in Cleveland to the Forest City Steel & Iron Co. The leading independent steelmaker states that if all business now up is closed before the end of the month that October will record better business than January. Plain shape prices continue strong at 2.50c, base Pittsburgh, despite shading in the East by smaller mills.

STRUCTURAL CONTRACTS PLACED

Building awards this week .....18,839 tons
Building awards last week..... 9,044 tons
Building awards two weeks ago.... 8,594 tons

4000 tons, seven apartments for Paterno interests, New York, 2000 tons, for four apartments going to Paterson Bridge Co.
2800 tons, May department store, Hill street between Eighth and Ninth streets, Los Angeles, to Llewellyn Iron Works.
2300 tons, Twin Branch Power Co., Indiana, awarded through the American Gas & Electric Co., to American Bridge Co.
2000 tons, Detroit Institute of Art, Detroit, reported awarded to Whitehead & Kales Iron Works.
1950 tons, babies' and childrens' and maternity hospitals, Cleveland, to Forest City Steel & Iron Co.
800 tons, county home at Wende, N. Y., to Buffalo Structural Steel Co.
600 tons, Tishman building, Forty-sixth street, New York, reported placed.
520 tons, Wilson foundry building, Pontiac, Mich., to Whitehead & Kales Iron Works.
500 tons, two spans, 125-foot girder bridge for Wheeling & Lake Erie railroad at Massillon, O., to American Bridge Co.
500 tons, loft building in West Thirty-seventh street, New York, to Lehigh Structural Steel Co.
450 tons, Coopersdale bridge, Johnstown, Pa., to Independent Bridge Co.
350 tons, bridgework for Norfolk & Western, to unnamed fabricators.
312 tons, crossing at Shreveport, La., for Vicksburg, Shreveport & Pacific railroad, to Mt. Vernon Bridge Co.
300 tons, stadium for Washington and Lee university, to independent fabricator.
300 tons, plant for the Quinze Power Co. Province of Quebec, awarded through Viele Blackwell & Buck, New York, to Hamilton Bridge Co.
263 tons, high school at Mishawaka, Ind., to Elkhart Bridge & Iron Co.
250 tons, ash pits for Rutherford, N. J., plant of the Philadelphia & Reading, to Belmont Iron Works.
200 tons, Pacific Southwest Bank building, Pasadena, Cal', to Llewellyn Iron Works.
200 tons, A. O. Smith Corp., Milwaukee, to Lakeside Bridge & Steel Co.
200 tons, superheater building for Power Specialty Co., St. Francis, Wis., to Lakeside Bridge & Steel Co.
136 tons, water tank and tower, Hibbing, Minn., to Minneapolis Steel & Machinery Co.
108 tons, digester building for Tomahawk Kraft Paper Co., Tomahawk, Wis., to Wausau Iron Works.
100 tons, apartment, Seventy-third street and Amsterdam avenue, New York, to Hay Foundry & Iron Works.

STRUCTURAL CONTRACTS PENDING

15,000 tons, steel plant and finishing mill for Ford Motor Co., Detroit; general contractors' figures asked.
10,000 tons, power plant for Public Service Corp., Newark, N. J.; specifications expected out shortly.
4500 tons, Greenburg loft building, Thirty-fifth street and Seventh avenue, New York; preliminary figures asked.
3000 tons, pier for Baltimore & Ohio railroad at Baltimore, Md.; bids in.
2500 tons, Reditch loft building, Thirty-seventh street, New York; placed in abeyance.
2400 tons, schools No. 205 and 210, each involving 1200 tons, New York; bids in.
1500 tons, Steinway building, Fifty-seventh street, New York, general contractors' bids asked.
1400 tons, Commonwealth-Edison Co., East Lake street substation, Chicago; pending.
1500 tons, Oil City, Pa., bridge; W. S. Rae, Pittsburgh, awarded general contract.
1300 tons, Hellman Bank building, Seventh and Spring streets, Los Angeles, bids in.

1200 tons, bascule bridge, California avenue, Chicago; indefinitely postponed.
1000 tons, apartment at 141 East Seventy-second street, New York; pending.
1000 tons, bridgework for Baltimore & Ohio railroad; pending.
1000 tons, bridge work for Louisville & Nashville railroad; bids to be received at Louisville, Ky., Oct. 23.
1000 tons, apartment at 167 West Seventy-sixth street, New York; pending.
1000 tons, Lapidus apartment, 210 West Seventieth street, New York; pending.
800 tons, bridge work for Big Four railroad, Cincinnati; bids in Oct. 23.
700 tons, addition to High School of Commerce, San Francisco; bids being taken.
650 tons, Mercy high school, Chicago; pending.
500 tons, bridgework for Pennsylvania railroad; pending.
500 tons, work for Kanawha & West Virginia; pending.
500 tons, addition to plant of Bourne-Fuller Co., Cleveland; pending.
500 tons, tunnel at Fairmont park, Philadelphia; bids asked through park commissioners.
500 tons, power plant addition, Weymouth, Mass.; bids in Oct. 19.
400 tons, high school, Bridgeport, Conn.; bids asked.
350 tons, Missouri Pacific bridges; bids in.
350 tons, high school at Chelsea, Mass.; refigured; bids being taken.
308 tons, J. B. Murphy memorial, Chicago, general contract to Morava Construction Co.
300 tons, Culver apartments, New York; bids asked.
300 tons, Knights of Columbus building, Springfield, Ill.; pending.
200 tons, addition to Durfee Mills, Fall river, Mass.; bids in.
200 tons, mounted armory, Providence, R. I., to independent fabricator.
150 tons, Stimpson warehouse, Cambridge, Mass., to Eastern Bridge & Structural Co.
110 tons, Pennsylvania railroad bridges; bids in.
100 tons, high school at Salem, Mass., bids being taken.
100 tons, addition for Textile Finishing Machine Co., Providence, R. I.; bids in.
100 tons, Harding junior high school, Lakewood, O.; bids in.
100 tons, stone and storage trestle for Kellys Island Lime & Transport Co., Kellys Island, O.; pending.

September Sheet Sales Increase Sharply

Pittsburgh, Oct. 16.—Sheet sales for September aggregating 223,556 tons by the independent group of sheet manufacturers reporting to the National Association of Sheet and Tin Plate Manufacturers show an increase of 106,897 tons over the August total of 116,659 tons, or from 39.9 to 86.2 per cent. Production fell off from 234,112 tons in August to 185,577 tons in September or from 80.1 to 71.5 per cent. Shipments, however, were maintained at approximately the same rate in September as in August or 79.3 and 80.2 per cent respectively, amounting in tonnage to 205,772 and 234,486 tons respectively. Unfilled tonnage on hand Oct. 1 was 343,096 tons as compared with 316,972 tons Sept. 1, or 132.3 and 108.4 per cent respectively.

	Net tons Sept.	Aug.	Per cent of capacity Sept.
Total sales.....	223,556	116,659	86.2
Total production.....	185,577	234,112	71.5
Total shipments.....	205,772	234,486	79.2
Unfilled tonnage as at			
Oct. 1	343,096	.....	132.3
Sept. 1	.....	316,972	108.4
Finished stock on hand			
Oct. 1	84,338	.....	32.5
Sept. 1	.....	102,354	35.0
In stock unsold Oct. 1	29,975	.....	11.6
Sept. 1	.....	32,252	11.0

The total number of hot mills in the United States now is 674, having a capacity for September 1923 of approximately 377,000 net tons. The percentage of the capacity to which the figures here are related is 68.8 per cent.

Car Inquiries Increase

Railroads Enter Market for Over 200 Locomotives—Missouri-Pacific Places 30,000 Tons and Reading 25,000 Tons of Rails

RAILROAD TRACK MATERIAL PRICES, PAGE 1067

Chicago, Oct. 16.—Chicago district steel interests believe they have confirmation of reports that railroads are contemplating coming into the market for an unusually large volume of equipment. At a recent meeting of railroad executives it is understood an agreement was reached that as soon as possible all requirements are to be placed. Railroad executives are convinced that fundamental conditions are thoroughly sound and that the measure of prosperity evidenced by the railroads in buying, will be reflected in an increased volume of freight traffic.

At the moment no large car inquiries are before the market but the undercurrent mentions four or five carriers with immediate needs ranging from 10,000 to 18,000 cars each. It is understood that the Union Pacific is about to inquire for 13,000 cars and an unnamed western road for 5000. That the total of car placements for the remainder of the year will reach 80,000 is not doubted.

In addition to heavy inquiry for spikes, bolts and tieplates reported last week, more inquiry has come out this week. No purchases, are yet reported. The Chicago & Alton 500-car inquiry remains pending. Swift & Co. is reported to have purchased 500 steel underframes.

Within a few weeks local mills expect to obtain their proportion of the 200,000 tons of rails which the Pennsylvania railroad probably will purchase. The Missouri-Pacific railroad has placed 10,000 tons of rails with the Colorado Fuel & Iron Co., from 8000 to 10,000 tons with the Tennessee Coal, Iron & Railroad Co. and approximately 14,000 tons with local mills.

The Wheeling & Lake Erie is figuring on the repairs of a large number of freight cars.

Railways Decide on Tonnages

Boston, Oct. 16.—Most of the New England street railroads have decided on first quarter rail requirements and have either closed or signified their intention to do so within a few days. Details covering awards are held up for the present, but the two heaviest buyers are understood to be the Springfield Street Railroad Co. and the Boston Elevated.

Car Inquiries Gain Strength

New York, Oct. 16.—An inquiry for 3000 coal cars for the Norfolk & Western railroad is a feature of the eastern railroad market. Another is an inquiry for 2000 cars for India. A large number of cars is pending for Australia, and large lists for domestic railroads, referred to in a recent issue, are in prospect for the near future. Orders the past week have been light. Locomotive inquiry includes 15 for the Baltimore & Ohio, while locomotive buying involves five switch engines for the Long Island railroad and an 0-8-0 type locomotive for the Aliquippa & Southern, both orders going to the American Locomotive Co.

Export rail inquiries include 5000 tons for the Victorian government, Australia, and 2700 tons for Brazil. Japan also is in the market for some small tonnages of rails aggregating about 2000.

Louisville & Nashville railroad it is announced will purchase equipment through the United States Trust Co., New York, according to an equipment lease filed recently in Kentucky. New equipment will consist of six Pacific-type locomotives, 30 Mikado locomotives, 14 all-steel baggage cars, 10 all-steel baggage apartment cars, 15 standard straight coaches and 2300 all-steel hopper bottom coal cars.

1924 Material Inquiries Grow

Pittsburgh, Oct. 16.—Light rail orders are few and far between. Operations of coal mines are on a declining scale and consumption is limited. Specifications on contracts with large producers are fair. The price is unchanged at 2.15c to 2.25c, base Pittsburgh. Even the rerollers' activity is curtailed, and while quoting prices of 1.90c to 2.00c, base Pittsburgh, they are not closing much business. They are rerolling more rails into concrete bars than into light rails.

Track accessory demand for December and into the first quarter of next year continues to grow. The Norfolk & Western will close shortly on a large quantity of tie plates on which 2.60c, base Pittsburgh, is quoted here. The Louisville & Nashville railroad is in the market for 14,000 kegs of standard spikes on which 3.15c is the usual quotation in this locality, with 3.50c quoted on small spikes. Jobbers who have stated they could buy small spikes at 3.25c, have since purchased small quantities at the full market price of 3.50c. Some demand exists for track bolts on which 4.00c is the minimum.

Locomotive Inquiry Heavy

Philadelphia, Oct. 16.—Philadelphia & Reading railroad this week placed its 1924 rail requirements aggregating about 20,000 tons. The Pennsylvania has not taken action on its requirements of from 100,000 to 125,000 tons. This tonnage is expected to be let soon.

Locomotive demand is becoming active again with inquiries out totaling more than 200. Of this amount, 59 are wanted by the Southern Pacific, 39 by the Louisville & Nashville, 80 by the Missouri-Pacific, an indefinite number by the Baltimore & Ohio, and an indefinite but large number by the Pennsylvania. The Kansas & Texas and the Chicago & Eastern Illinois are also in the market.

CAR ORDERS PLACED

Philadelphia & Reading, 40 suburban passenger coaches, 10 combination baggage cars, to Harlan & Hollingsworth Corp.
Swift & Co., 500 steel underframes, reported placed.

CAR ORDERS PENDING

For export to Australia, 600 box cars, 500 gondolas and 100 steel cars; pending.
Louisville & Nashville, 2300 hopper cars, 15 standard coaches, 10 all-steel baggage apartment cars and 14 all-steel baggage cars; pending.
Norfolk & Western, 3000 coal cars; pending.
For export to India, 2000 cars; pending.

The Nonferrous Metals

Weakness in Copper Is Dominant Feature—Zinc Firmer After Slump —Tin Irregular—Aluminum Trade Fair

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Oct. 10.....	12.75	13.25	41.50	6.92½	6.27½	25.00	7.50	29.00
Oct. 11.....	12.75	13.25	41.37½	6.92½	6.22½	25.00	7.62½	29.00
Oct. 12—Holiday								
Oct. 15.....	12.75	13.00	41.62½	6.92½	6.20	25.00	7.62½	29.00
Oct. 16.....	12.75	13.00	41.62½	6.85	6.30	25.00	7.62½	29.00

†Outside market quotation.

NEW YORK, Oct. 16.—Weakness in the copper market has been the dominant feature of the nonferrous metals in the past week, though other metal prices have had an easy tendency. This week the Belgian offer of a new reparations conference has been reflected in a little more hope in the copper market here and in London, also in the stock market, causing a check to the price declines. Domestic buying of metals has been light and though shipments continue heavy, the markets have been sluggish.

With the decline in electrolytic copper prices to 12.75c, delivered Connecticut, all the allied products for which electrolytic serves as a market base, such as lake, casting, composition ingot, copper and brass rolled and drawn products and scrap have declined to new low levels for 1923. Shipments of refined copper in September were 160,000,000 pounds, against 205,000,000 pounds in August, while production was maintained at about 200,000,000 pounds. In consequence there was an increase in stocks of about 40,000,000 pounds, news of which further depressed the trade's confidence. The price, however, has been sufficiently low to be attractive to some large buyers, for example Western Electric Co., which recently purchased upward of 20,0000,000 pounds at 13c.

Zinc prices eased off in the absence of pronounced domestic buying and no export sales, but today both London and St. Louis were strong. The September statistics of the American Zinc institute showed a decrease in smelters' stocks of slab zinc amounting to 3578 tons, but this was enabled by export shipments of 8167 tons, showing the continued dependence of the American market upon an export outlet for excess production. Production was 39,105 tons, against 41,625 in August; shipments were 42,683 tons, against 36,394 in August. The premium on brass special has decreased to five to 10 points, as brass mills have been buying little more zinc than copper.

The lead market eased a little, to 6.60c, East St. Louis, which price was done for carlots for middle western delivery. The outside market in the East has receded on tonnage business to about the price quoted by the American Smelting & Refining Co. on its regular contract business, 6.85c New York. Statistically, lead is in a strong position and domestic production continues to be augmented by lead originating in Mexican ores smelted in bond in this country, and taking a duty of 1½c a pound.

The tin market has moved irregularly, with the general trend much in doubt. Prices for spot Straights tin have ranged between 41.37½c and 42.37½c. American consumers have been buying little tin, having covered October and fourth quarter requirements rather fully in their buying last month. The East continues to sell fairly freely with the world price above £200.

Spot antimony has been steady, with sales reported at 7.62½c, duty paid, for spot metal.

Virgin ingot 98 to 99 per cent aluminum is selling at 25c, delivered, in the outside market; 99 per cent at 26c. These prices are the same as maintained by the domestic producer. Business is fair. It is expected that within a few weeks important consumers will be negotiating their 1924 requirements.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 4 oz., min..	21.25
High brass	17.50
Zinc, ga. 9 to 18 (plates ½c less)	**9.25**
Lead, full sheets (cut ¼c more)	**10.75**
Aluminum, base 18 ga. and up...	**35.40**
SEAMLESS TUBES	
High brass	22.50
Copper	24.00
RODS	
High brass, round, ⅝ to 2½-inch	15.25
Naval brass rod.....	18.00
WIRE	
Copper	15.62½ to 15.75
High brass	18.00

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.00 to 9.50
New York	8.50 to 8.75
Chicago	9.00
HEAVY YELLOW BRASS	
New York	6.00 to 6.25
Chicago	6.75 to 7.25
Cleveland	6.25 to 6.75
ZINC	
New York	4.25 to 4.50
Cleveland	3.75 to 4.25
HEAVY COPPER AND WIRE	
Cleveland	10.50 to 11.25
New York	11.25 to 11.50
Chicago	10.50 to 11.00
RED BRASS TURNINGS	
New York	7.75 to 8.00
Cleveland	8.50 to 8.75
Chicago	8.25 to 8.50
YELLOW BRASS TUBING	
Cleveland	6.00 to 6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.50 to 6.75
Chicago	6.50
ALUMINUM BORINGS	
Cleveland	9.50 to 10.00

Fire Prevention

Thoroughly Discussed at Meeting—Exhibit Fire Fighting Apparatus

A complete discussion and illustration of fire prevention and fire fighting methods and apparatus featured the joint International Fire Prevention congress and the National Fire Prevention exposition held in the Seventy-first Regiment armory, New York, Oct. 8-13. Addresses were uniformly of exceptional character and thoroughly covered the fire hazard from every standpoint. A leading feature of the exposition was the exhibit of the Underwriters Laboratories, Inc. Important exhibits also were shown by the National Association of Steel Furniture Manufacturers; the National Automatic Sprinkler association, the Associated Metal Lath Manufacturers and by various manufacturers of sash, safes, fire extinguishers and other fire protection devices. A portion of the space in the armory was set aside as a moving picture theater and there was a continuous program of motion pictures showing fire prevention and fire fighting apparatus.

The joint congress and exposition served as the chief event in the observance of fire prevention week designated originally by President Harding. Various speakers at the congress commented on the fact that by far the greatest loss of property and life in the Japanese earthquake holocaust resulted from the fire succeeding the earthquake rather than the earthquake itself. It was contended that loss of prpoerty by fire is an item whose importance is not appreciated by the average citizen. For instance, the cost of fire losses together with the maintenance of a fire fighting department and the upkeep of the various services which are necessary in handling fire insurance and fire losses, assumed proportions in Boston last year to the extent of an outlay of $10 for every man, woman and child. The use of noncombustible materials was urged in building construction generally and the importance of utilizing the various safeguards was pointed out.

Plan Annual Meeting

The second annual meeting of the American Management association which will take place at the Hotel Astor, Oct. 29-31 will be devoted to the problems of "Human Relations in Commerce and Industry." Owen D. Young, chairman of the board of the General Electric Co., is chairman of the general convention committee. A feature of the convention will be the annual dinner at which the subject of discussion will be "Stabilizing Prosperity in America." Among the speakers will be John Hays Hammond, chairman of the Federal Coal commission; Willis H. Booth, president of the International Chamber of Commerce and vice president of the Guaranty Trust Co.; Elisha Lee, vice president of the Pennsylvania railway system and others.

The Hendee Mfg. Co., in its income statement for the fiscal year ended Aug. 31 shows a net of $207,737 against a deficit of $1,273,328 in the preceding year. Sales aggregated $4,687,797.

Western Market Is Good

Let Contract for Bull Run Pipe Line Involving 17,000 Tons of Plates—Construction Continues—Concrete Bar Awards Total 5000 Tons

LOS ANGELES, Oct. 13. — The outstanding feature of the Pacific coast steel market this week, was the awarding of the Bull Run pipe line project, Portland, Oreg., involving 17,000 tons of plates, to the Willamette Iron & Steel Works, Inc., Portland.

General business conditions in and around Los Angeles are excellent with general demand continuing heavy. Construction is far above normal. During September permits issued numbered 5236 with a value of $14,099,353 as compared with 4270 permits and a total of $10,267,894 for September a year ago. Forty cities in the Pacific southwest, including Los Angeles, report a total of $24,107,337 for the month of September as compared with a total of $31,346,671 for 37 cities in August.

Pig Iron and Coke

Foundry operations in this section are being carried on on a much larger scale than elsewhere on the Coast and little or no buying is being indulged in. Prices are easing off and one interest this week received a quotation of $30 c.i.f. duty paid, San Pedro, for Scotch iron running 2.75 to 3.25 silicon, 0.8 to 1.00 manganese, and 0.5 phosphorus.

Only scattered small lot sales are being made in the coke market. One lot of 500 tons of Scotch coke was recently purchased by one large interest at $16 a ton delivered. A large sanitary ware plant in this district is now using Milwaukee coke. The majority of sales, however, are for the foreign material.

Bars, Plates and Shapes

Demand for soft steel bars is light and small tonnages only are being booked by the Coast mills. Importers are offering Belgian and other foreign bars at as low as 2.35c c.i.f. duty paid Pacific ports and a fair tonnage in the aggregate has been sold. On the other hand, demand for concrete bars is exceptionally heavy in this section and those mills specializing on this class of material are operating at a good rate. Recently over 5000 tons have been awarded, outstanding among which was 700 tons for an apartment house in Los Angeles secured by the Truscon Steel Co. Larger projects pending involve over 3000 tons. Prices remain firm at 3.50c f.o.b. Los Angeles for lots of 200 tons or over.

No new inquiries have been put out for fabricated oil storage tanks, though the General Petroleum Corp. is asking for figures on 1200 tons for four 80,000-barrel tanks they plan to erect themselves. The Los Angeles Mfg. Co. secured pipe line for the city of Los Angeles involving 700 tons of ¼-inch plate, the material being placed with several independent mills. Prices have weakened slightly and while the leading interest and Bethlehem are booking business at 3c and over, most of the smaller independents are quoting from 2.60c to 2.65c, Atlantic seaboard, equivalent to 2.90c to 2.95c c.i.f. coast ports. One large interest within the last day or two obtained a quotation of 2.50c, Atlantic seaboard.

Structural shape fabricators in Los Angeles report their shops as being filled with enough work in sight to keep them going until well into next year. In addition to over 3000 tons being awarded recently and over 2000 tons pending, there are 14 large buildings about ready for figures and which should be closed before the first of the year. Prices have softened and one interest this week has quoted as low as 2.55c, Atlantic seaboard. The general run is from 2.60c to 2.65c equivalent to 2.90c to 2.95c here, figuring the 30-cent water rate which is being and can be obtained.

Other Finished Material

Stocks of sheets in the hands of consumers and distributors in this locality are heavier than they have ever been. Sheet metal shops are working to capacity and stocks are rapidly dwindling so that it will be only a question of a few weeks at the most before buyers will be forced to come into the market again. Prices are being firmly maintained at 3c, 3.85c and 5c for blue annealed, black and galvanized sheets respectively. Inquiries have increased.

Not a single railroad inquiry is up for figures. In the San Francisco district 1000 tons of rails for the Eureka Municipal railway and 370 tons is pending. The latter will go to the United States Steel Products Co. as Lorain section was specified. The Pacific Electric railroad has placed 400 kegs of track bolts and the Los Angeles railway, 1000 kegs of track spikes.

Northwest Business Active

SEATTLE, Oct. 13.—The week's outstanding feature was the opening of bids at Portland for the Bull Run water pipe line, involving about 132,400 lineal feet of pipe ranging from 50 to 60 inches in diameter. Alternative bids were received for riveted steel pipe and for lock bar pipe. The Willamette Iron and Steel Works tendered a bid of $2,571,193.94 and was the lowest for lock bar pipe. The lowest bid for riveted steel pipe was submitted by J. H. Tillman Co., $2,628,644.50. Between 15,000 and 17,000 tons of material are involved in this job which is the largest awarded on this coast in many months.

The Willamette Iron & Steel Works, which has a $2,000,000 plant and employs 1000 men at Portland, plans to fabricate the pipe at its works.

Finished Material

Prices are unchanged except nails which have been cut to 4.15c per keg base. Jobbers state that business continues fairly active. Jobbers are still short of roofing sheets although stocks will soon be replenished by supplies enroute from the East. Logging and lumber manufacturers are buying as required, the warehouses reporting a good turnover of heavy material. Fabricating plants are busy as several good sized jobs are being turned out. Building materials are in good demand as construction work continues unabated. While it is rumored that Japan has placed heavy orders in New York local mill representatives state there is an almost complete absence of export inquiry.

Pig Iron and Coke

Business is quiet in pig iron because the trade is well supplied for present needs. The turnover of coke is about normal, the bulk of the demand being supplied from Fernie, B. C. in combination with local grades. There is ample Glengarnock pig iron in stock to meet the hand-to-mouth demand. This grade is quoted at $36, although some has been sold, according to report, at $35.50. About 300 tons of Chinese iron have been landed at Portland.

Bars, Plates and Shapes

There is nothing outstanding in this market. Most business is in small tonnages, no large new contracts being in prospect. Plates and shapes are in fair demand. Due to price cutting by one jobber, local warehouses have agreed to make a fixed reduced price in bidding on work for the city, county and other large buyers of bars. This price for contract work is 3.75c although the retail prices remains unchanged at 4.10c.

Old Material

This market is weaker than a fortnight ago. The demand is limited and the turnover negligible. One large buying interest is reported to be paying $12 gross for steel scrap which is the lowest level in some time. Cast iron is also inactive but prices remain the same, $20 to $22 according to grade. Stocks are low. Dealers are marking time as there is no incentive at present to accumulate supplies. There is no export inquiry and no immediate prospect that the Orient will be interested in the near future.

Ford Steel Works

Contracts Now Are Being Placed—Big Tonnage of Steel Required

Pittsburgh, Oct. 16.—Inquiries for 15,000 tons of steel by the Ford Motor Co. forecasts that work on the first unit in its proposed steelworks and rolling mill will be undertaken in the immediate future. The first building to be laid down will house a continuous type blooming mill similar to the unit now in operation at the Gary works of the Steel corporation. This mill, it is understood, is to be used for the production of sheet bars and is being built by the Morgan Construction Co., Worcester, Mass. The motor for driving this unit will be constructed by the General Electric Co., Schenectady, N. Y., and will develop 8000 horsepower at a speed of 240 revolutions per minute.

Merchant mills also are included in the expansion program of the Ford Motor Co., although as far as can be learned, contracts for the mills have not as yet been closed. The motor for driving the merchant mills now under construction at the Schenectady, N. Y., plant of the General Electric Co., is a 4500-horsepower unit. Plans for the installation of steelworks equipment still is in the experimental stage and definite information is lacking as to the number and capacity of openhearths that the company contemplates building.

Makers of Farm Equipment To Meet in Cleveland

With Alexander Legge, president of the International Harvester Co., to present the implement manufacturers views on current problems; S. M. Sellers, president of the National Federation, and Grant Wright secretary-treasurer of the Eastern Federation of Implement Dealers associations to cover the situation from the retailers' point of view, and with Magnus W. Alexander of the National Industrial Conference board and W. H. Stackhouse of French & Hecht to speak on general business conditions, the program of the thirtieth annual convention of the National Association of Farm Equipment Manufacturers showed appeals to all interested in the businesss prospects for the implement business during the next year. The convention will be held in Hotel Statler, Cleveland, Oct. 24-26.

In addition to those mentioned, others well known to the farm equipment industry have accepted places on the program, among them George R. James, former wagon manufacturer and at present a member of the federal reserve board; William Black, B. F. Avery & Sons; B. J. Kough, Deere & Co., Finley P. Mount, Advahce-Rumely Co., and J. R. Howard, president of the National Transportation institute.

Foreign trade as well as domestic problems will be considered at the convention. Finance, agriculture, transporation and other important questions will be discussed. E. S. Jordan, president, the Jordan Motor Car Co., will be the principal speaker at the banquet which will be held on the evening of Oct. 25. The program as announced by the association is as follows:

WEDNESDAY, OCT. 24

Morning Session

Call to order by J. B. Bartholomew, president, invocation, president's address, felicitations by auxiliary, announcements, election of nominating committee, appointment of committees, address by H. J. Hirshheimer, acting chairman executive committee, report of secretary, H. J. Sameit.

Afternoon Session

Address by Alexander Legge, president, International Harvester Co.; address by S. M. Sellers, president, National Federation of Implement Dealers' association; "South American Opportunities," by William Black, president, B. F. Avery & Sons.

THURSDAY, OCT 25

Address by George R. James, member federal reserve board, "Our Public," by Finley P. Mount, president, Advance-Rumley Co. "Standardization," by B. J. Kough, manager, John Deere Plow Works.

Afternoon Session

Address by M. W. Alexander, managing director, National Industrial Conference board, "Certain Aspects of Present Business Conditions," by W. H. Stackhouse, general manager, French & Hecht. "Know the Dealer," Grant Wright, general secretary-treasurer, Eastern Federation of Implement Dealers associations.

Evening

Annual dinner, toastmaster, President Bartholomew; invocation; address by E. S. Jordan, president, Jordan Motor Car Co.

FRIDAY, OCT 26

Morning Session

Address by J. R. Howard, president, National Transportation institute, Chicago; executive business session, report of necrology committee, report of resolutions committee, report of nominating committee, remarks of newly elected officers, remarks of retiring officers.

Car Loadings Keep Up; Employment Less

Washington, Oct. 16.—Freight car loadings for the week of Oct. 6 again were well in excess of the million mark and totaled 1,079,690 compared with 1,097,274 the week of Sept. 29 which was the high record and 1,060,436 for the week eneded Sept. 22. Loadings of iron ore the week of Oct. 6 were 67,425 a decline of 1747 cars from the preceding week .

September employment statistics collected by the department of labor show a slight decline in the iron and steel industry and little change in general employment. The machine tool industry leads in the ratio of increased employment.

Sheets for Japan

Fill the Mills on Some Gages—Buy in Usual Channels

New York, Oct. 16.—Japanese steel demand has broadened considerably the past week. It is believed sheet orders placed by Japanese buyers aggregate fully 15,000 to 20,000 tons. This involved 30 and 31 gage black sheets for early shipment. All makers now are sold up for the remainder of the year on this material, and have declined orders for at least 5000 tons; on this the mills named January and February shipment which was too late for Japanese buyers. Considerable wire nail inquiry has come out from Japanese sources, fully 50,000 kegs now being under negotiation; however, actual nail purchases during the past week have been small. Some wire rods have been placed for Japan during the week and considerable pipe business is coming out; one Japanese buyer now is on the point of placing 1000 tons of pipe for immediate shipment. Some bar, plate and structural inquiry now is coming out for Japan but outside a few carloads, no sizable sales of these products are reported. Japan has placed considerable bar tonnage in Europe and is not expected to place many bars here unless European mills are unable to make delivery.

While no definite word has come from Japan, it currently is believed by best informed authorities that establishment here of a Japanese buying syndicate is unlikely. It is expected buying of Japanese requirements will continue to be done along normal lines by the various companies who always take a part in that business.

Among export orders of the past week were a few hundred tons of light rails for Formosa. A number of standard rail inquiries which recently came out from Japan, Brazil and other foreign sources, remain pending.

An inquiry from South America calls for a round tonnage of galvanized wire. Generally South American demand is small. Cuban buying also is small. In fact, the Japanese requirements cover most of the export activity.

Bank For Mill Repairs

Chicago, Oct. 16.—Two Illinois Steel Co. blast furnace stacks at Joliet have been banked, during repairs in the mills, but will resume in a few days. This leaves the Illinois Steel Co. with twelve steelworks blast furnace stacks active at Gary and nine at South Works. General operations of Illinois Steel Co. continue slightly above 90 per cent.

British Railways Buy Equipment

London Northeastern Awards 10,200 Cars and 78 Locomotives and Steelmakers Hope for General Equipment Buying—European Market, Excepting Germany Improved —British Steel Production in September Gains but Pig Iron Falls

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Oct. 16.—A large purchase of equipment by the London Northeastern railroad has stirred the hope among iron and steel producers that the British railroads are about to enter upon a large program of betterments for which they will draw upon their huge financial reserves aggregating £100,000,000. The orders placed by the London Northeastern railroad include 10,000 freight cars, 200 passenger cars and 78 locomotives.

European iron and steel business is better on all sides excepting Germany. British mills have received fair specifications from Japan for structural material, sheets and tin plate. China, South America and Australia also have bought tin plate in considerable quantity. The United States has sold rails to Burma, India, one of the crown colonies.

Midlands pig iron has been sold at £4 7s 6d ($19.86). Paris reports the sale of 500 tons of billets at £7 15s ($35.19) delivered. German coke in France has been advanced to 212 francs ($12.95) f.o.b. frontier.

It is reported that the Cockerill and the d'Ougree-Marihaye works in Belgium have divided an order for 25,000 tons of rails for Argentine consumers.

Dusseldorf reports that the Wolff agreement with French authorities to restart the Phoenix and Rheinische Stahlwerke properties has not been resumed. As a result the operations of these plants are uncertain. German coke has been advanced to £3 ($13.62).

British production of pig iron in September was 559,000 tons compared with 599,800 in August; 642,000 in July; 692,000 in June; 710,000 in May; 655,200 in April; 633,600 in March; 543,000 in February and 567,900 in January. British steel production in September totaled 695,000 tons as against 582,700 in August; 642,000 in July; 692,000 in June; 815,000 in May; 749,400 in April; 802,500 in March; 707,100 in February and 624,300 in January.

British iron and steel exports not including scrap totaled 334,000 tons against 330,431 in August and 308,000 in July. September imports were 116,000 tons against 121,006 in August and 114,000 in July.

Changes in the British market this week bring No. 3 Derbyshire foundry pig iron to £4 10s ($20.43) and No. 3 Northamptonshire foundry pig iron to £4 7s 6d ($19.86), a slight reduction.

Pound sterling is figured on a basis of $4.54.

Middlesbrough Exports Highest Since May 1914

European Staff Special

BIRMINGHAM, Eng., Oct. 5.—The trade revival is progressing much more slowly than was anticipated, but the position is not without encouraging features. Among these is the fact that the tonnage of manufactured iron and steel shipped from Middlesbrough last month was the heaviest since May, 1914. The total was 63,843 tons, surpassing the previous high record of the year in March by 1420 tons. The figures exceeded those of August by over 50 per cent. India is a remarkably good customer, taking 19,466 tons. Egypt comes second with 5011 and Nigeria third with 4690. The purchases by Japan were practically normal, with a tonnage of 1845.

Pig iron shipments were not in any way special, the total being 34,827 tons compared with 34,795 tons in August. But increased business with several foreign buyers compensated for the reduction of sales to Germany which fell from 15,247 tons in August to 4833 tons in September.

The pig iron industry has been assisted by falling coke values, a conference of cokemakers and furnacemen having agreed to a reduction of 2s ($0.45) per ton in Yorkshire furnace coke, making the new price £1 4s ($5.46) at the ovens. The total of furnace and similar coke exported in August was 326,365 tons as compared with 234,628 tons in July and more than twice the quantity of June. Cleveland coke is about 5s ($1.13) cheaper at £1 15s ($4.96) delivered, and at Barrow prices are correspondingly easier. Some steps are being taken to produce coke locally in the Barrow area. Apparently, supplies are just a little easier to obtain.

Sterling—$4.55

So far, the makers of pig iron have not been compelled to pass on to their customers this saving of a few shillings per ton in the cost of production, a contingency they would scarcely have escaped three months ago. In the Midlands the makers are shy of heavy tonnages with deliveries spread over a long period. Makers are much more successful in disposing of their output, and after waiting nearly two years the large furnace built by Dorman Long & Co. of the Clarence Ironworks is to be put into operation. The furnace has a weekly capacity of 2500 tons. In the Barrow area demand has so greatly improved that any probability of further curtailment of output has disappeared, and if the inquiries developed during the last few days lead to business, more furnaces are likely to be in operation. The stocks at the furnaces are not now so serious an element in the situation.

The improvement in the sheet and tin plate trades is continuing and but for the cautious handling of prices would probably have been reflected by this time in advances. All the mills are well booked and in the Welsh district six others are being built, expected to be in operation by the end of the year. The price is maintained

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, October 15

British Market

Corrected to Date by Cable
Home Market Prices. Gross Tons at Works or Furnace

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	32.35	7 2 6
Sheet bars	32.35	7 2 6
Wire rods	49.37	10 17 6
FINISHED STEEL		
Steel bars, England, ⅜ to 3-inch	41.43	9 2 6
Steel bars, England, ⅜ to 3-inch, for export	38.59	8 10 0
Plates, ship, bridge and tank, England	40.86	9 0 0
Plates, ship, bridge and tank, England, for export	39.16	8 12 6
Plates, ship, bridge and tank, Scotland	40.86	9 0 0
Plates, ship, bridge and tank, Scotland, for export	39.73	8 15 0
Beams, England	40.86	9 0 0
Beams, England, for export	38.59	8 10 0
Beams, Scotland	40.86	9 0 0
Beams, Scotland, for export	38.59	8 10 0
Sheets, black, 24 gage	59.02	13 0 0
Sheets, black, 24 gage, for export	57.89	12 15 0
Sheets, galvanized, 24 gage	87.40	19 5 0
Rails, 60 pounds and over	38.59	8 10 0
Rails, 60 pounds and over, for export	36.32	8 0 0
Tin plate, base box, 108 pounds	5.22	1 3 0
Steel hoops	52.21	11 10 0
Steel hoops, for export	49.94	11 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	22.47	4 19 0
Hematite, West Coast, Mixed Numbers	22.02	4 17 0
Basic, Middlesbrough	21.34	4 14 0
No. 3 Foundry, Middlesbrough	21.79	4 16 0
No. 3 Foundry, Derby, Leicester, Nottingham	20.43	4 10 0
No. 3 Foundry, Northamptonshire	19.86	4 7 6
No. 3 Foundry, Staffordshire	20.71	4 11 3
No. 3 Foundry, Scotch	22.93	5 1 0
Ferromanganese, 76 to 80 per cent	79.45	17 10 0
COKE		
Yorkshire furnace	5.45	1 4 0
Yorkshire furnace, for export	10.22	2 5 0
Yorkshire foundry	7.38	1 12 6
Yorkshire foundry, for export	10.78	2 7 6

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported
PIG IRON

	$	Pounds per metric ton (2205 lbs.)
Hematite	26.33*	5 16 0
Foundry, No. 3	26.33	5 16 0
Stahleisen, Siegen	28.38	6 5 0
Foundry, No. 1	26.33	5 16 0
Luxemburg Foundry	22.25	4 18 0
COKE		
Lower Silesian furnace	13.62	3 0 0
Lower Silesian foundry	13.62	3 0 0
SEMIFINISHED STEEL		
Billets	41.92	9 4 8
Sheet bars	43.51	9 11 8
Wire rods	52.66	11 12 0
FINISHED STEEL		
Standard rails	56.75	nominal
Merchant bars	49.71	10 19 0
Structural shapes	49.54	10 18 3
Ship plates	56.03	12 6 10
Medium plates, 3 to 5 millimeters	62.61	13 15 10
Sheets, 3 to 1 millimeters	74.46	16 8 0
Tin plate	143.92	31 14 0
Plain wire	74.97	16 10 3
Bands and strips	61.95	13 12 11

All prices are f.o.b. furnace or mill.
*German prices now quoted in pounds, sterling.

French Market

Prices Last Reported
PIG IRON

	$	Francs per metric ton (2205 lbs.)
Hematite, Lorraine	30.55	500
Basic bessemer, Lorraine	27.50	450
Foundry, Longwy, No. 3, sand-cast	26.88	440
Foundry, Longwy, No. 3, chill-cast	27.50	450
Ferromanganese, 76 to 80 per cent	91.65	1,500
COKE		
French furnace	8.25	135
German furnace, f.o.b. frontier*	12.95	212
German furnace, f.o.b. frontier**	15.28	250
French foundry	2.75	145
SEMIFINISHED STEEL		
Blooms	32.69	535
Billets	35.74	585
Sheet bars	36.97	605
FINISHED STEEL		
Standard rails	36.66	600
Merchant bars	39.72	650
Angles	37.88	620
Normal beams and profiles	37.88	620
Plates, ship and tank, 10 millimeters and thicker	40.94	670
Plates, bridge and tank, 5 to 10 millimeters	41.55	680
Sheets, black, 3 millimeters	43.99	720
Sheets, blue annealed, 2 millimeters	52.36	870
Shafting, cold-drawn, 40 to 60 millimeters	76.38	1,250
Bars, 2 per cent nickel steel	109.98	1,800

All prices are f.o.b. furnace or works.
*Up to 50 per cent of normal requirements.
**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported
PIG IRON

	$	Francs per metric ton (2205 lbs.)
Basic bessemer, Belgian	23.41	445
Basic open-hearth, Belgian	24.72	470
Gray forge, Belgian	14.20	270
Foundry, No. 3, Belgian	24.20	460
Foundry, No. 3, Luxemburg	23.67	450
Foundry, No. 3, Lorraine	23.67	450
SEMIFINISHED STEEL		
Blooms	30.25	575
Billets	31.56	600
Sheet bars	32.35	615
Wire rods	48.66	925
FINISHED STEEL		
Standard rails	36.82	700
Merchant bars	38.66	735
Normal beams and profiles	36.82	700
Plates, 5 millimeters and thicker	41.03	780
Sheets, black, 3 millimeters	44.18	840
Sheets, galvanized, 1 millimeter	106.25	2,020
Plain wire	65.75	1,250
Galvanized wire	78.90	1,500
Wire nails	68.38	1,300

All prices are f.o.b. furnace or works.

at £19 ($86.45) minimum with small additions where prompt delivery is called for. It is now clear that some of the sheet buying in view of the requirements of Japan has been of a speculative character. The black sheet trade is moderately busy, but with a certain amount of idle plant in South Staffordshire.

The position is probably more favorable in the tin plate department than in galvanized sheets. Business with Canada is broadening, and some orders have been taken from the United States, especially in the oil carrying department. Skilled labor has become scarce. Richard Thomas & Co., the largest manufacturer of tin plates has decided to build six additional mills at their Burry Extension works, at an expenditure of £50,000. The works are in the neighborhood of Llanelly and were utilized during the war largely for the manufacture of shell steel. The price continues unchanged at £1 3s 1½d ($5.26) per box, although an increasing proportion of the business is done at 3d ($0.05) to 6d ($0.11) above this figure.

The progress in galvanized sheets and tin plate has reacted favorably on the general steel position. South Wales ordinarily is a large seller of unfinished steel in other districts, especially the Midlands. But at present there is little surplus material after local requirements have been met, and this circumstance has hardened prices generally. Mild steel billets are maintained at the £7 15s ($35.26) minimum, but fewer makers are willing to sell at the price. A more general quotation is £8 ($36.40) to £8 5s ($37.53). Foreign competition continues ineffective, sales of Belgian billets being restricted to occasional lots, for disposal somewhat below English prices, owing to special circumstances. One such lot was offered this week at £7 7s 6d ($33.55). The few quotations coming through are generally £7 15s ($35.26) or over. The rise in continental values has extended to No. 3 Belgian iron quoted this week at £9 ($40.95), a rise of fully 7s 6d ($1.70) on the week. This material would still be able to compete with Staffordshire nut and bolt bars selling at £10 12s 6d ($48.34).

The improvement in the finished steel trade is largely sentimental, orders not coming along in large volume, although makers are encouraged by better specifications. The railways are still poor buyers and the Barrow rail mills have been idle for two weeks having exhausted their orders. They have now taken a new contract which will keep them employed until No-

vember. The Workington mills are running and the activity of the hoop department with the demand for sections is likely to keep the works busy until the end of the year. Practically no price changes have taken place during the past week or two.

The prices in the Staffordshire iron trade appear to be stabilizing, the wages board return for July and August showing an insufficient change in the selling prices to affect wages which are accordingly confirmed for the next two months. An encouraging feature is the rise in steel scrap values which a fortnight ago were quoted at £3 17s 6d ($17.63) and are now £4 2s 6d ($18.76). The latest quotation named is £4 5s ($19.33) as the business figure. There are signs that the agricultural districts are coming along with their warehouse orders which, even in the dullest times, can generally be counted upon in the autumn.

Material Shortage Accentuated in Japan

Foreign Special Service

TOKIO, Sept. 19.—Rigorous enforcement of the profiteering law by the Japanese government has prevented the price of iron and steel from going much higher although it continues to get stronger. As a whole the price prior to the great earthquake prevails. Scarcity of all shapes and materials is much accentuated as Tokio and Yokohama citizens are beginning the work of reconstruction. Lively trade is in sight. Importers and domestic steel and iron mills are engaged in active operations.

The Japanese government has made many additions to the list of free goods recently published. Principal additions are: Pig iron, nails, sheets, wire, galvanized sheets, tin plate, copper nails, iron pipes and tubes, rivets, nuts, bolts, railway equipment, electric wires and cables, materials and shapes required in building and repairing houses, bridges, docks, etc., hooks and other small metal goods, valves and cocks, chains and locks, tools, agricultural implement, stoves, radiators, gas, ampere, water, volt and watt meters, sewing machines, telegraph and telephone apparatus, etc. Although automobiles and motor trucks and parts also are added to the free list, half rates are to be levied on pleasure cars and parts. It is expected that other materials, tools and machinery, which are required for the reconstruction of the cities will be added soon.

The government announces that importation of all articles necessary for reconstruction of Tokio and Yokohama, and merchandise required to fill shelves of merchants will be undertaken on its own account if the liberal help given by the Bank of Japan and the Yokohama Specie bank and the suspension of import duties be found inadequate to stimulate import trade to the desired extent.

Great scarcity of iron and steel materials and shapes, especially tin plates, galvanized sheets, black sheets and nails which are required in building temporary sheds, is unrelieved. The shortage threatens to prevail in Osaka and other towns untouched by the great calamity, because stocks there have been requisitioned by the government and sent to Tokio and Yokohama. Galvanized sheets can not be covered in Osaka unless 5 to 6 per cent premiums are paid. Import merchants are convinced of the wisdom of placing orders with British and American makers. Already some have cabled orders to their American and British sellers. The total orders for galvanized sheets as placed up to yesterday is estimated at 5,000,000 sheets. It is expected Japanese buyers will soon be searching abroad for nails, wires, steel sheets, rails, steel bars, etc., in vast quantities.

A few merchants are placing orders with the Government Steel Works of Japan. For the last several days the works, a government institution, are stated to have received orders for more than 100,000 tons, and are filled with official orders. The works' blast furnaces which were half closed prior to the calamity are all in blast again and are being operated to capacity.

With possibility of large business in view British financiers and manufacturers have started activities here in Tokio. A British firm here, believed to represent financial interests in Lombard Street and leading manufacturers in England, has approached the Mayor of Tokio with a plan to advance 1,000,000,000 yen on the condition that such capital be used in buying commodities required for reconstruction of Tokio in England.

THIS is the first report on Japanese iron and steel conditions as affected by the recent earthquake to be received by IRON TRADE REVIEW *from its correspondent, Mr. J. Takano of Tokio who was fortunate to escape injury in the great catastrophe. It represents the first authentic statement to be published in the business press of what the Japanese nation is doing to supply its tremendous needs of reconstruction material. Accordingly, it should be of special interest to the American iron, steel and metalworking industries.—EDITOR.*

Japan Orders German Wire and Nails

European Special Service

BERLIN, Oct. 2.—Such heavy orders have been received from Japan for wire and wire nails that German production of nails is sold out almost completely for the next three months. Most of the wire shipped to Japan has been on a basis of £16 per ton f.o.b. for plain wire, equivalent to 3.30c per pound, while nails have been sold at £16 to £17, equivalent to 3.30c to 3.50c per pound.

Up to this time business has not been affected by the recent political disturbances. The question of disposing of the large stocks of iron and steel products accumulated in the Ruhr is engaging attention on all sides. Most observers are beginning to realize, however, that the reorganization of transportation and production in the Ruhr will be so slow that this problem may more or less solve itself. At any rate, both German and French interests are anxious to market the Ruhr accumulations in such a way as to have as little effect as possible on general conditions in the European iron and steel trade.

100,000,000 marks—$0.62

Export duty must be paid on steel shipped from the Ruhr whether consigned to foreign countries or to unoccupied Germany. Reduced to a gold basis, the credits granted by the German government to the iron and steel industry of the Ruhr during the occupation totaled $5,000,000. This covers only direct advances to iron and steel manufacturers. These advances will have to be paid back on a gold basis.

General conditions remain unsatisfactory, with prices in many cases above world levels. All restrictions against exportation of finished steel have been withdrawn although the exports of ores, billets, sheet bars, wire rods, and tinplate still are prohibited. Export trade is hampered by the high cost of production brought about by the necessity for importing so much ore and coal. The cost of producing finished steel is said to be about 150 gold marks ($37.50) per ton at present.

Rail business is somewhat better. A large order for rails and track materials has been received from the Roumanian government. There is a shortage of merchant bars and large quantities are being imported, mainly

from Czecho-Slovakia and the Saar. Sheets are slow and producers have reduced their output by 25 per cent. The demand for ship plates and medium plates is still good. The importation of tin plate has been prohibited except under license but this does not affect tonnages already covered by contracts.

Business Slowing Up in Belgian Market

European Staff Special

BRUSSELS, Oct. 5.—The iron and steel trade has slowed down due to recent developments in the Ruhr and violent fluctations in exchange rates. The Belgian franc moved up with the French franc, with the result that export business has fallen off sharply. Producers are now beginning to regret the policy which they have been following for several weeks of keeping down their commitments as they soon may need the tonnage. Prices are being adjusted downward except for pig iron which is holding up well in the absence of competition from the Lor-

Franc—$0.055

raine district. Semifinished steel products are being quoted at various prices depending upon the amount of tonnage the mills have on their books.

Merchant bars are fluctuating around 740 francs ($40.70). Structural shapes, plates and sheets remain unchanged. Pipe prices are unusually firm and the tube mills are heavily committed. Galvanized pipe has advanced due to increased cost of zins. Proposed improvements in the port of Antwerp is attracting the attention of Belgian fabricators. Several large firms are preparing tenders on 15 3-ton electric cranes, bids for which will be opened at the city hall of Antwerp on Oct. 16. It has been reported that the Belgian plant of Dyleet Bacalan at Louvain has recently obtained an order for 3000 freight cars for the Eastern railway of France. The Ateliers Nicaise et Delcuve at la Louviere, have just been awarded an order for 15 first-class passenger cars for the chemin de fer Andalous of Spain, on which they quoted the price of 110.665 pesetas each.

Bookings Gain During Week in Canada

Foreign Special Service

TORONTO, Ont., Oct. 15.—Recent reduction in Canadian pig iron prices have not stimulated demand, and inquiry without exception is for early delivery. Melters are showing some interest in the market, but this is confined to immediate needs. One feature of the market is that importing interests are not laying in large tonnages of iron and shipments from England are much below those a year ago. Despite a light demand for pig iron production shows no falling off and furnaces in blast are operating at a rate that has not been exceeded since the close of the war. Prices are unchanged as follows: No. 1 (2.25 to 2.75 silicon), $31; malleable, $31; No. 2 (1.75 to 2.25 silicon), $30, Toronto. No. 1 and malleable, $33.50; No. 2, $31.50, Montreal. British iron, Summerlee and Carron, are quoted at $40 and $39 respectively in lots of 5-ton and upward, warehouse, Montreal.

New business closed for finished iron and steel during the past week or ten days shows a slight gain. Orders from Japan have greatly strengthened the market for bars, but Canadian mills are unable to meet British competition in sheets and little or none of the Japanese sheet demand has been placed in this country. Demand for bars for local consumption is not brisk, but mills are closing a satisfactory volume of business and orders for small lots are continually being received. Bars are firm at 3.10c, Toronto. Structural steel is moving in a steady manner and orders calling for large tonnages in the aggregate recently have been closed. Shapes and beams are quoted at 2.70c, Toronto. Practically no change is reported in the demand for plates. Plates are quoted at 2.60c, Toronto. Demand for sheets improved during the week. Dealers and consumers placed orders more freely than formerly. No. 28 gage black sheets are quoted at 4.60c; No. 10 gage, blue annealed 3.70c; and No. 28 gage, galvanized, 6.00c, Toronto.

While local scrap interests have been looking forward to a stronger demand this has so far failed to materialize and in all cases melters are confining buying to small tonnages for immediate needs. A limited tonnage of heavy melting steel and turnings is going to steel plants, but these buyers are showing no interest in material for delivery later in the year. Dealers are offering $14 for heavy melting steel and $10 for turnings in gross tons, Toronto. Steel and wrought axles are in small demand with dealers taking small shipments occasionally at $15 and $18 per gross ton respectively. Boiler plate is moving slowly with dealers offering $10 per gross ton, Toronto. Foundries continue to show interest in No. 1 machine cast and despite the fact that dealers are offering $20 per net ton for this material a shortage prevails. Malleable scrap, standard car wheels and stove plate are quiet with dealers offering $15 per net ton, Toronto.

Scrap Decline Is General

(Concluded from page 1068)

Impression in the trade is that bottom is about reached and that a buying movement is not far distant.

Congestion Still Prevails

St. Louis, Oct. 15.—The market for iron and steel scrap is congested and weak. Sharp price reductions were made through virtually the entire list, the only items escaping being cast grades. Railroad material is being offered at low figures, some items being at the lowest levels in several years. A tonnage of uncut boilers was purchased from a carrier at $2 per ton, which is only 20 cents higher than this material sold during the depression in 1907. All varieties of scrap for steel plants, including specialties, are sharply lower and almost impossible to sell even at the reductions.

Several large yard interests, have laid off a large part of their help and are contemplating closing down completely. The Madison plant of the Laclede Steel Co. was down during the first week of October, and is now operating on a greatly reduced schedule. Railroads are endeavoring to clean up accumulations before the arrival of winter weather. The cotton belt offered 1000 tons; Rock Island, 5600 tons, and Wabash, 4000 tons.

Market Still Is Quiet

Birmingham, Ala., Oct. 15.—Southern iron and steel scrap market continues quiet. New business being done is light and quotations show no change except in machine shop borings and cast iron borings, $8 being asked for the former and $9 for the latter. Heavy melting steel is a drag on the market, the largest melter placing no orders now, but being content to wait until the product is needed and it can be had at an acceptable price. Dealers in old material are keeping a large assortment of scrap on hand and delivery is not a market factor. Local consumers can get any tonnage they need delivered almost over night. Railroads still offer large quantities of old material.

Buffalo Prices Mostly Nominal

Buffalo, Oct. 16.—The market is weaker with limited buying. Most prices quoted are nominal because there are no transactions. Small heavy melting steel sales have been made at $16, but mills are not interested. The plant which ordered suspension of shipments two weeks ago, is expected to order resumption this week but this is the only factor of improvement.

Hearing on Steel Merger Set for Oct. 31

Washington, Oct. 16.—Beginning Oct. 31, hearings on the complaint of the federal trade commission against the purchase of the Midvale Steel & Ordnance Co. and allied properties by the Bethlehem Steel Corp., last year will be started with the taking of testimony in Boston. It is the aim of the trade commission to expedite these hearings as much as possible, and testimony will be taken at Boston, New York City, Buffalo, Philadelphia and Washington, at buildings to be designated later.

A total of 46 companies were made respondents in the complaints issued by the federal trade commission on Jan. 26, with 11 in the Bethlehem group, 13 companies in the Lackawanna group and 22 companies in the Midvale group. The complaint pointed out alleged competition existing between the Bethlehem-Lackawanna group prior to the acquisition of Lackawanna by the Bethlehem company and that existing between the Bethlehem, Lackawanna and Midvale groups at the time of the proposed three company merger.

While the trade commission's complaint only charged the mergers with being in violation of the federal trade act, it held they were contrary to the public policy laid down in the Sherman and Clayton acts. The complaint of Jan. 26, wiped out the previous Bethlehem-Lackawanna complaint, dated June 5, 1922, upon which no hearing was held. The respondent companies filed their answer early in March, and the case then became an issue.

If the trade commission's hearings result in the complaint being sustained, the commission will order the merger cancelled and the recourse from this is appeal to the federal circuit court of appeals. The attorney general's department previously had given approval of the purchases of the Bethlehem company.

Molders' Demand May Tie Up St. Louis Shop

St. Louis, Oct. 15.—Demands of union molders for a flat increase in wages of $1 per day is threatening to tie up about 50 per cent of the jobbing and specialty plants in this district. The present pay is $7 per day, and $8 is asked, with the alternative of a walkout if the increase is not granted. The International Brotherhood of Foundry Employes, which includes most foundry workers outside of molders, has lined up with the latter and is asking a flat $1 a day increase. The minimum wage of these workers is 52 cents per hour. About half the foundries are union, the other 50 per cent operating on the open shop plan. The stove plants are not affected by the present demands, they having a contract with their molders running until January. The position of the foundry operators is that they can not afford to meet the advance at this time, and it is expected the issue will be brought to a head early this week. A walkout would seriously affect the machine shops, many of which depend on the job foundries for castings.

Locomotives Are Added

Washington, Oct. 16.—September shipments of railroad locomotives for domestic account totaling 313 gained 54 over the 259 total of August, and foreign shipments also increased slightly, according to figures of the department of commerce. Foreign shipments in September totaled 22 engines, compared with 13 in the preceding month and six in September, 1922. Domestic shipments from principal manufacturing plants in the nine months ending with September total 2115, as compared with 585 in the corresponding period in 1922. Foreign shipments in the nine months this year totaled 136, as compared with 175 locomotives in the corresponding period a year ago.

Unfilled orders for locomotives at the end of September totaled 1102 for domestic account, a falling off from that of 1406 at the end of August and 1347 at the end of September, last year. Unfilled orders for foreign shipment were 76 at the end of September, compared with 91 at the end of August and 116 at the end of September, 1922.

Benzol Profits Gain

London, Oct. 6.—The report of the Bengal Iron Co., for the year ending March 31, 1923, indicates that the iron and steel industry in India improved considerably. The net profit for the year covered by the report was £286,699 ($1,300,000) compared with £103,314 ($470,000) in 1922 and £310,552 ($1,430,000) in 1921. Last year a dividend of 7 per cent was declared on the common stock compared with 2½ per cent in the previous year. The results would have been more satisfactory if it had not been for the prolonged strike on the East Indian railway which interfered considerably with traffic to and from the company's plant. The Bengal company operates five blast furnaces at Koti, Bengal. The annual report states that a fourth battery of coke ovens is almost completed.

September Coke Output Shows a Decline

Washington, Oct. 16.—Production of coke in by-product ovens continued to decline slowly during September. The total output for the month was 3,112,000 net tons, according to the geological survey. The daily output was 103,729 tons, as against 104,402 tons in August, a decrease of 0.7 per cent. Of the 70 plants, 65 were in operation and 5 were idle. The coke produced was 85.8 per cent of the present capacity of all the plants. Production from beehive ovens also declined. The month's output of beehive coke is estimated at 1,373,000 tons, as against 1,494,000 tons in August. The total output from both types of ovens declined from 4,733,000 to 4,485,000 tons. The decreased activity in coke manufacture reflected in part a decline in the output of pig iron and steel, and in part the settlement of the anthracite strike. The following table shows the monthly records of coke production:

	By-product coke	Beehive coke	Total(a)
1917 monthly av..	1,870,000	2,764,000	4,634,000
1918 monthly av..	2,166,000	2,540,000	4,706,000
1919 monthly av..	2,095,000	1,638,000	3,733,000
1920 monthly av..	2,565,000	1,748,000	4,313,000
1921 monthly av..	1,646,000	462,000	2,108,000
1922 monthly av..	2,374,000	669,000	3,043,000
July, 1923.....	3,267,000	1,582,000	4,849,000
August, 1923.....	3,239,000	1,494,000	4,733,000
September, 1923..	3,112,000	1,373,000	4,485,000

(a) Excludes screenings and breeze.

The steady decline in the production of beehive coke that has been in progress since June continued during the first week of October. The total production in that week is estimated at 313,000 net tons, a decrease of 8000 tons. This is the lowest weekly output recorded since the first week of January. The decrease was confined to Pennsylvania and Ohio. Cumulative production during 1923 to date stands at 14,815,000 tons, or more than three times the output during the corresponding period in 1922. The weekly record by districts follows:

	Oct. 6, 1923(a)	Sept. 29, 1923(b)	Oct. 7, 1922
Pennsylvania and Ohio	253,000	265,000	130,000
West Virginia	16,000	15,000	12,000
Alabama, Kentucky, Tennessee & Georgia	20,000	18,000	13,000
Virginia	13,000	13,000	8,000
Colorado and New Mexico	6,000	6,000	6,000
Washington and Utah..	5,000	4,000	4,000
United States total....	313,000	321,000	173,000
Daily average	52,000	54,000	29,000

(a) Subject to revision. (b) Revised from last report.

The first week in October saw a sharp drop in soft coal output to 10,782,000 tons. There was a recovery in the second week of the month to about 11,000,000 tons.

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Steel Treating Field Expands

AMERICA'S youngest of the larger technical organizations, the American Society for Steel Treating, continues to attract attention by its vigorous growth. At Pittsburgh last week, the society held the largest convention and exposition it has yet attempted and the unqualified success was a tribute to the sound and mature judgment of the management. Within three years, or since formation of the society in 1920, its membership has grown about 50 per cent, or to approximately 3000 members. The membership is open to "the man at the fire" as well as to the metallurgist and the plant executive and the society is proud of the fact that it has been able not only to retain its membership but has been able to show gains in all classifications.

As is widely recognized the art of heat treatment has made its most rapid advance since the war, thus it is only natural that the American Society for Steel Treating in its growth and activities should reflect the increasing interest in that field. Registration figures at Pittsburgh showed the degree to which the organization is doing that. Total registration reached nearly 1800 of which 1492 were listed as members. With a net membership of 3000, the attendance at this year's convention was nearly 50 per cent and about 10 per cent better than at Detroit last year. Technical sessions at which heat treatment problems were discussed were unusually well attended. The exposition covered one-third more space than in 1922 and yet was not sufficient to provide for all applications. During the five days the doors were open it is estimated over 40,000 people passed through, thereby establishing a new record.

Already the society is feeling need for expanding its field and is developing a new constitution defining its scope. As organized at present the purpose of the society is "to promote the arts and sciences connected with the treatment of iron and steel" and refers more specifically to the treatment subsequent to the manufacture of the material. In the utilization of alloy steels, the manufacture is becoming an important consideration. In addition, certain nonferrous metals are demanding attention as regards heat treatment. Therefore, appreciating the importance of the rapidly widening field the purpose of the society in the proposed constitution has been made to read "to promote the arts and sciences connected with either the manufacture or treatment of metals, or both."

The proposed broadening of the field of the society is logical, even though the "manufacture of metals" is almost limitless in its scope under unrestricted interpretation. If the proposal is adopted and the society directs its attention to the treatment of metals and to such phases of their manufacture as are pertinent to their subsequent treatment or use, it will be found the field is sufficiently large to absorb all the energies of members of the organization for years to come.

Foreign Copper Sways Market

COINCIDENT with the decline in copper prices to the present level of 12.75 cents a pound, the lowest price since 1914 excepting in the 1921 depression, has been a startling change in the character of our foreign trade in the red metal. For many years American exports of metallic copper have greatly exceeded imports of metallic copper, but in three out of four recent months imports have exceeded exports. In 1913 imports of copper amounted to 148,928 tons; exports, 463,121 tons; excess of exports, 314,193 tons. Thus far in 1923 imports have totaled 226,957 tons; exports, 263,159 tons; net excess of exports, only 36,545 tons. The reason for this trend toward reversal in our copper foreign trade is dual. One cause is the growth of South American, African and Alaskan low cost production, most of which copper comes to the United States for refining and, as there is no duty, is immediately competitive with copper originating in this

country. The other main cause is the decrease in European consumption resulting from the European political unsettlement.

In the years before the war, South America, Alaska and Africa attained a combined output of slightly less than 100,000 tons annually. In the present year their combined output will approximate 350,000 tons. The copper market is international and the American price for copper is determined by conditions of world supply and demand. Thus it is that in a year which has seen the heaviest American peacetime consumption of copper ever attained, a bear market has almost continuously prevailed. The foreign copper has a sufficiently low production cost so that in the event of inability of foreign and domestic consumption to absorb the total amount refined in this country, the foreign low cost metal will supplant the output of some higher cost domestic properties.

Knowledge of this increase in foreign supplies and fears of further decreases in world consumption have kept a damper on American buying confidence since March.

Change in Money Market Imminent

THE close relationship between movements of interest rates and of bond values long has been recognized. That swings in the financial markets move in sympathy with fluctuations of the industrial pendulum also is well known. It has remained, however, for Col. L. P. Ayres, business economist, and vice president of the Cleveland Trust Co., to establish and catalog the normal sequence of these various complex movements. This has been done by a careful study of general business, short-time interest rates and bond prices over the last 40 years.

The results are of special interest to business men because of the light they shed upon the probable outlook for money rates and of business activities in the coming months. The conclusion reached by Colonel Ayres as presented in the current Business Bulletin of the Cleveland Trust Co. is that "short-time money rates normally rise during the latter part of a period of business recovery, and then continue their upward course for some months after the peak of prosperity has been passed."

Based upon this analysis, it is predicted that interest rates apparently are about to start upon a prolonged downward movement, while bond prices should start upon a long-time upward swing. This is explained by the fact that since short-time money has been high, long-time rates are also relatively high, and bond prices are low. If short-time rates turn down for a long swing, bond yields also will tend to fall, and bond prices will rise.

Rising bond prices which imply low interest rates, also mean a decreased rate of business activity and a somewhat lower level of commodity prices. With the demand for banking funds for commercial uses less active money naturally tends to flow into investment bonds. Discussing the business outlook Colonel Ayres says:

"When the records of 1923 are finally entered in the annals of American business the year will be described as one of prosperity. At the same time it is probable that 1923 will mark a definite turning point downward in the course of business. There is good reason to believe, however, that we are not headed for any period of drastic depression. But nearly all of the familiar indications point to a less active year in 1924 than the one now drawing to a close."

Iron and steel production in 1923 promises at least to reach the highest previous records in history. A moderate recession from that level in 1924 necessarily would not mean a period of poor business.

Sales Policies Control Output

WHILE the United States Steel Corp. last week produced ingots at the rate of 90 per cent of capacity, operations of small independents reflected considerably less activity. A canvass of eastern mills showed that, excluding the plants of the Bethlehem Steel Co., only 32 open-hearth furnaces were active out of 89 which were accounted for.

This difference in production is due to the divergent sales policies of the leading interest and the smaller makers. When J. C. Neale testified at the Pittsburgh basing point hearings in New York some months ago, he was questioned about the selling policies of the Midvale Steel & Ordnance Co. and the Carnegie Steel Co., with both of which he had been identified in an executive sales capacity. He testified that the Carnegie company makes contracts on which deliveries average from six months to one year following the sales. He pointed out that the Carnegie company's buyers, on an upward movement, thus received the benefit of the lower prices at which the business originally had been booked. He explained that it had been his policy with the Midvale company to sell only for a limited period ahead and thus by being able to make early deliveries when the big mills were congested, he secured for his company the full benefit of a rising market. He explained that a full order book was of no great advantage to a smaller company when the market declined, as the customers insisted on receiving the benefit of the lower prices.

The present difference in operations at independent and at Steel Corporation plants, therefore, is a logical result of the sales policies pursued by both. While the small mills will continue to operate in a comparatively limited way until business improves, they should be in the usual favorable position to take full advantage of the next big buying movement when it comes.

Constructive Events Appear

Improvement in Steel Trade and Upward Movement of Agricultural Prices are Favorable Developments of Business Situation—Many Other Trends Are Conflicting—September Construction Shows Slight Decrease

BY JOHN W. HILL, FINANCIAL EDITOR

CONFLICTING movements in financial and commodity markets have continued to dominate the economic picture and confuse business sentiment. Favorable and unfavorable developments have mingled curiously. Outstanding among the constructive events have been the distinct improvement in the steel trade and the upward movement of prices for farm products, with accompanying fading of excessive agricultural gloom. Adverse conditions in these great fundamental industries had contributed largely to the general feeling of apprehension. The show of strength in them now is reassuring. Even the stock market, under a cloud for weeks, indicated some improvement in sentiment early this week.

On the other side of the balance sheet, copper prices have shrunk to the lowest level in two years, New England cotton mills are curtailing, and the petroleum industry is passing through more reductions in crude oil prices. In Europe the situation is puzzling, though Germany seems to be getting herself in hand. Meanwhile preliminary negotiations are restarting some of the industries in the Ruhr, and Germany is getting some of the Japanese steel orders. The mathematical madness of the German mark, exhibited by a flight to six billion for one dollar, means nothing save the certainty of ultimate repudiaion.

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Despite the unquestioned lull in many directions of industry in recent months, activities continue upon a high plane. This is seen in the steel industry, where important units are producing at 90 per cent of capacity. It is seen also in the automobile industry. As shown by the Business Trend the output of passenger cars and trucks in September was 328,000. This was a decline of only 5 per cent from August, compared with a normal seasonal falling off for the month of from 20 to 25 per cent. The September record was 6 per cent ahead of the same month last year. Current reports indicated continued activity, with some seasonal curtailment. The nine months' output of automobiles was 3,084,000 passenger cars and trucks. A year's total of near 4,000,000 seems likely.

Building continues to decline, though the decrease in awards as shown in the Business Trend in September was the smallest for any month since spring. Industrial building gained in September, for the first time since May. Freight traffic is still phenomenal. With the progress of October, the peak traffic month the ability of the roads to meet all demands is coming to the test. In the last week of September the net daily average surplus of cars fell to the smallest number for any week since last spring. Some congestion, though not acute, is probable before the month ends.

The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	Average 1913
Business failures	292	357	...	390	...
Cash ratio Fed. Res. System	76.1	75.8	75.9	75.7	...
Loan rate, 4-6 Mo. N. Y. (per cent)	5-5¼	5-5¼	5¼	4¼-4½	5½-6
Aver. 25 ind'l shares	$100.62	$102.84	$101.86	$106.67	$58.19
Average 25 rail shares	$57.03	$58.42	$56.40	$68.53	$82.97
Aver. 40 bonds	$76.05	$75.94	$76.31	$81.28	$93.00
Car loadings (week ended Sept. 29)	1,097,274	1,060,580	1,092,567	988,381	*992,283
Bank debits 245 cities (000 omit'd	$9,178,368	$10,094,807	$8,338,903	$9,659,435	.....

*1920

FOREIGN EXCHANGE (Demand)

	Normal	Oct. 15 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.53	$4.55	$4.53	$4.43
Francs	19.3c	6.10c	6.00c	5.77c	7.57c
Lira	19.3c	4.57c	4.52c	4.40c	4.23c
Marks	23.8c	0.0000008c	0.0000001c	0.0000007c	0.03c

MONTHLY COMPARISON

	September	Month before	Year ago	Monthly average 1913
Dodge building Awards in 36 states	$288,931,000	$298,629,000	$310,000,000	$82,126,000
Business failures: Number	1226	1310	1566	1336
Liabilities	$28,000,000	$34,334,722	$36,908,000	$22,732,000
Exports	$381,000,000	$311,352,000	$313,196,000	$207,000,000
Excess of gold imports	$26,780,000	$30,636,000	$23,065,628	†630,716
Bureau of Labor Price Index	*150	151	155	100
Bradstreet's Price Index	141.6	139.7	130.7	100
Economist's British Price Index	4305	4188	4257	2717
Cost of Living Index	*161.6	161.9	154.5	100
New incorporations	$500,830,000	$335,462,000	$650,044,000	$172,301,000
Railroad net earnings	$98,600,000	$84,591,400	$51,475,000	$59,900,000

†Monthly average excess exports. *August.

The Business Trend

October 18, 1923

TRADE TODAY, TOLD BY IRON TRADE CHARTS

GENERAL SITUATION—Financial and business sentiment pronouncedly mixed; steel trade is better, however, and distinct improvement has appeared in agricultural situation; continued general activity in business probable for remainder of year; no basic economic weakness apparent.

BUILDING CONSTRUCTION—September volume of awards reported by F. W. Dodge Corp. of 39,391,000 square feet was drop of 2 per cent from August; smallest decline since spring; industrial building gained.

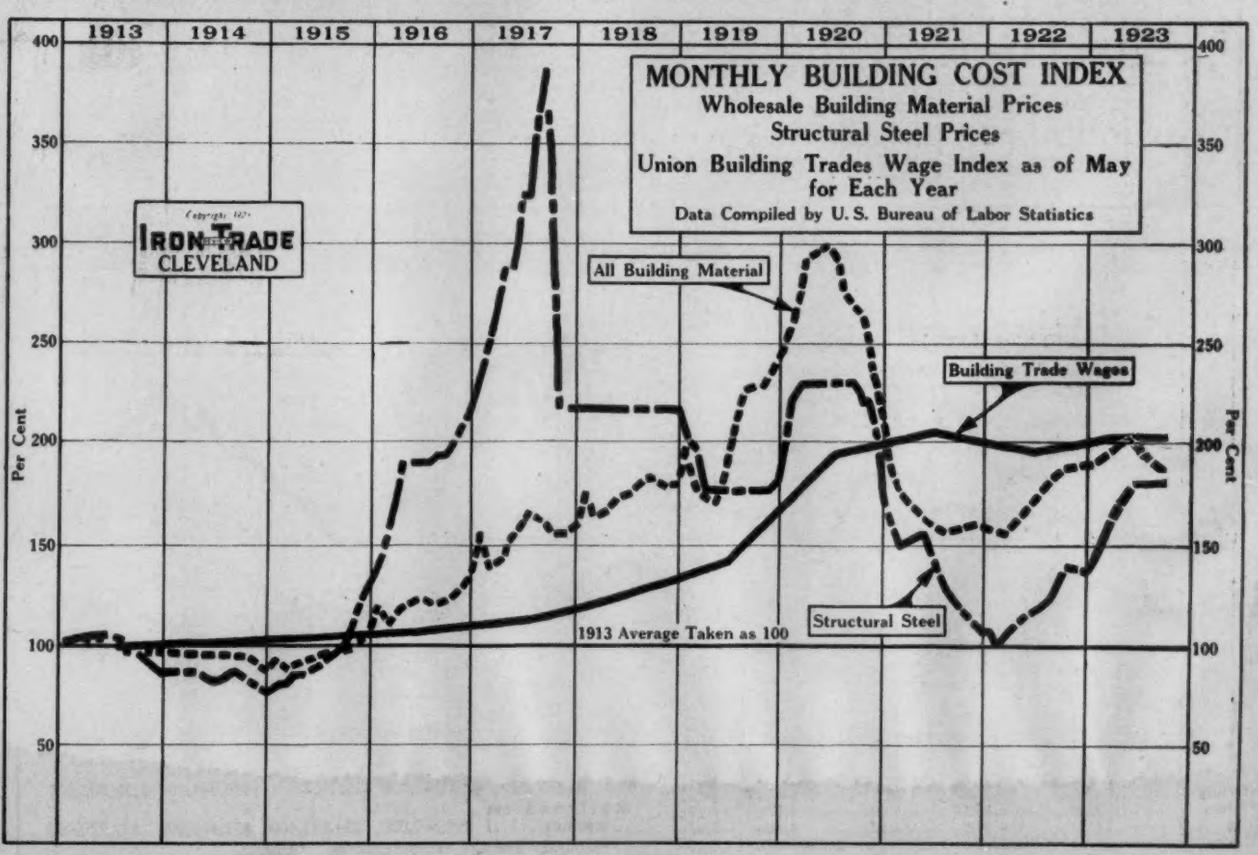
BUILDING COSTS—Strike of building buyers which began last spring causes drop of 10 per cent in cost of building materials; wages no lower; structural steel prices continue steady.

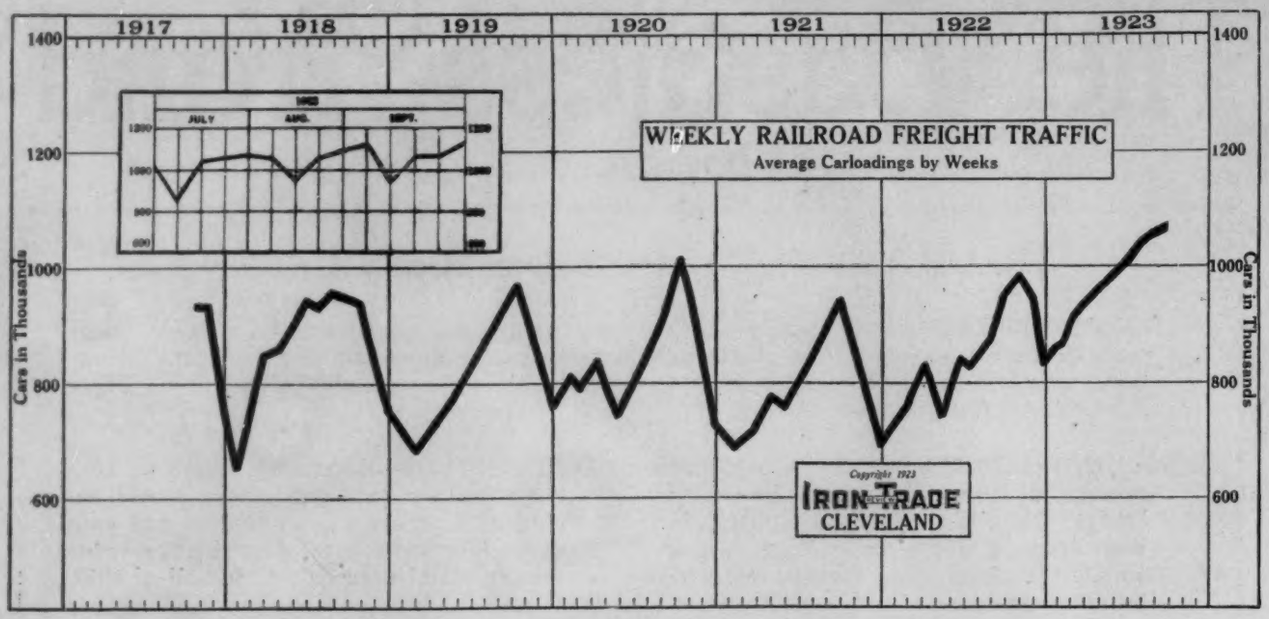
TRAFFIC—Week ended Sept. 29 brought new high record for traffic movements with car loadings of 1,097,274 cars; surplus of cars of 26,000 drops to lowest point since last spring.

AUTOMOBILES—Estimated output of 328,000 passenger cars and trucks shows decline of 5 per cent from August and gain of 61 per cent over year before; nine months' total exceeds that for all of 1922.

UNFILLED ORDERS—Decline of 378,913 tons in unfilled orders of the United States Steel Corp. for September smallest recession since May; total orders down 32 per cent from year's top.

PRICES AND FAILURES — Bradstreet's wholesale commodity index has advanced during last two months; now is 41.6 per cent above 1913 level; number of insolvencies in September smallest in many months.




1917
1918
1919
1920
1921
1922
1923
1400
1200
1000
800
600
Cars in Thousands
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
1923
JULY
AUG.
SEPT.
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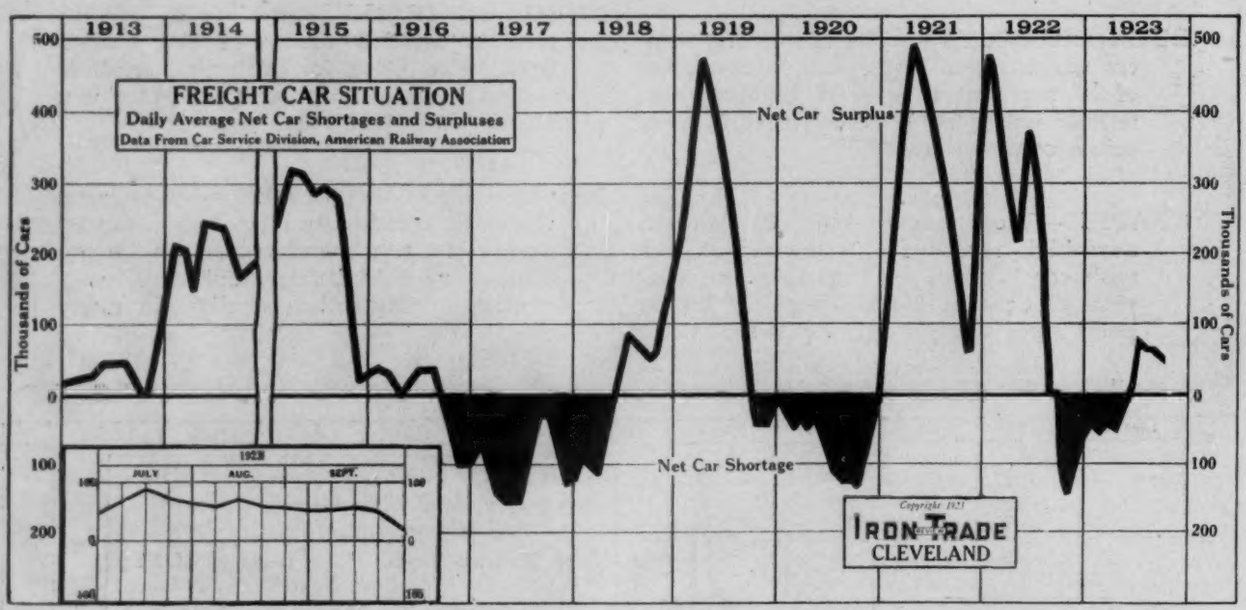
IRON TRADE
CLEVELAND


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
500
400
300
200
100
0
Thousands of Cars
FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
1923
JULY
AUG.
SEPT.
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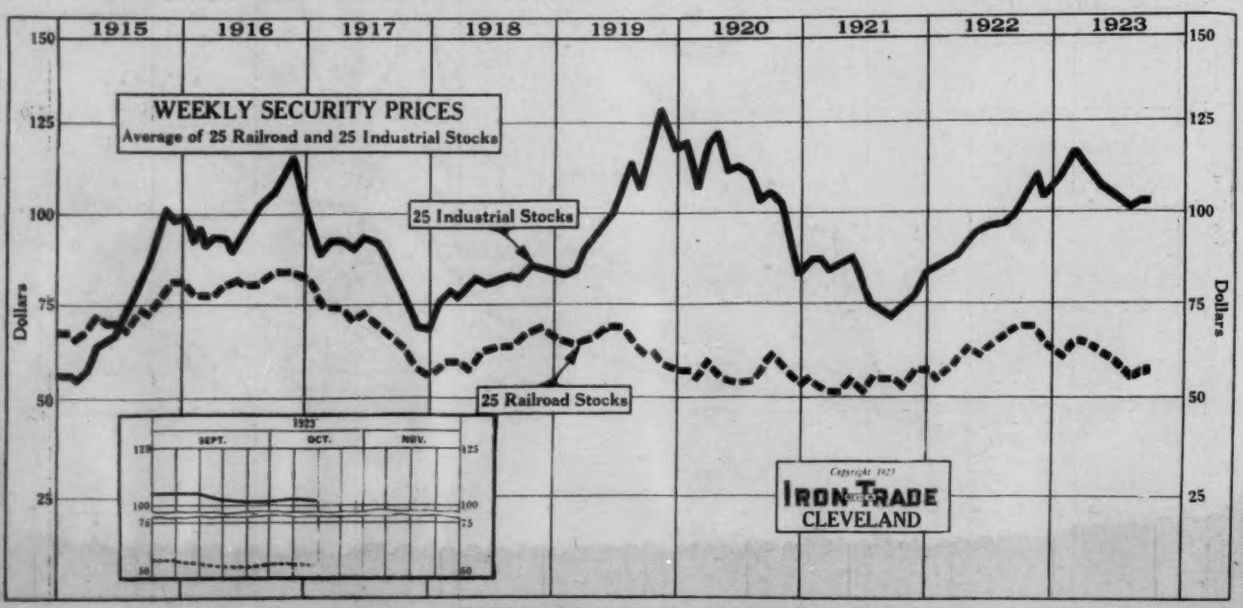
1915
1916
1917
1918
1919
1920
1921
1922
1923
150
125
100
75
50
25
Dollars
WEEKLY SECURITY PRICES
Average of 25 Railroad and 25 Industrial Stocks
25 Industrial Stocks
25 Railroad Stocks
1923
SEPT.
OCT.
NOV.
Copyright 1923
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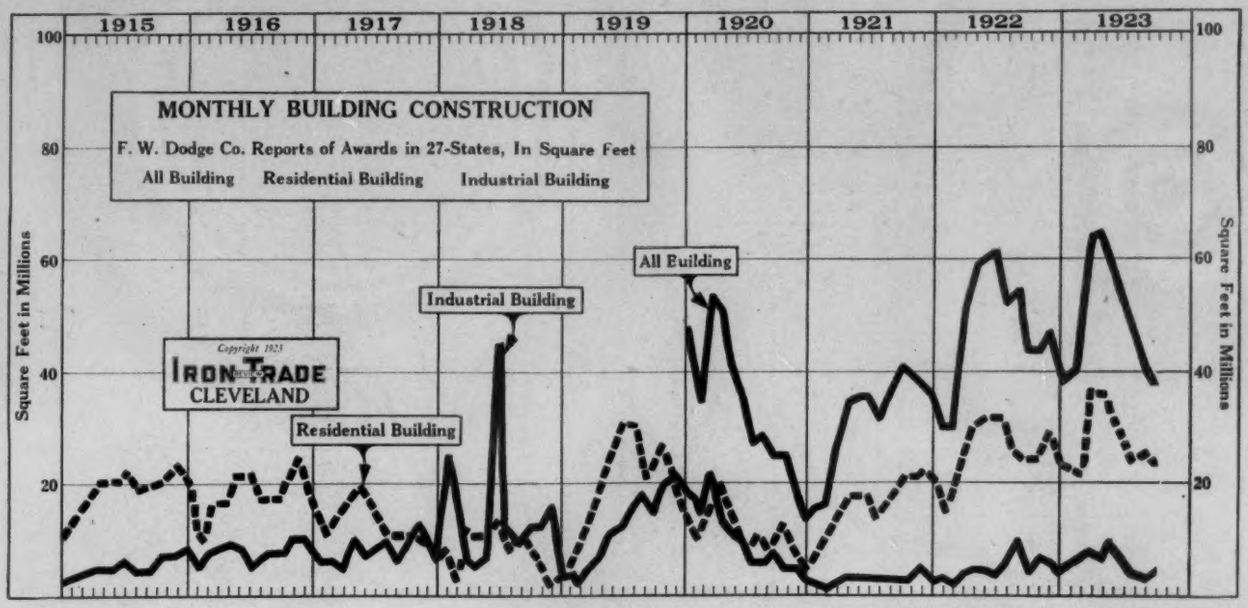
CLEVELAND


1915
1916
1917
1918
1919
1920
1921
1922
1923
MONTHLY BUILDING CONSTRUCTION
F. W. Dodge Co. Reports of Awards in 27-States, In Square Feet
All Building Residential Building Industrial Building
All Building
Industrial Building
Residential Building
Copyright 1923
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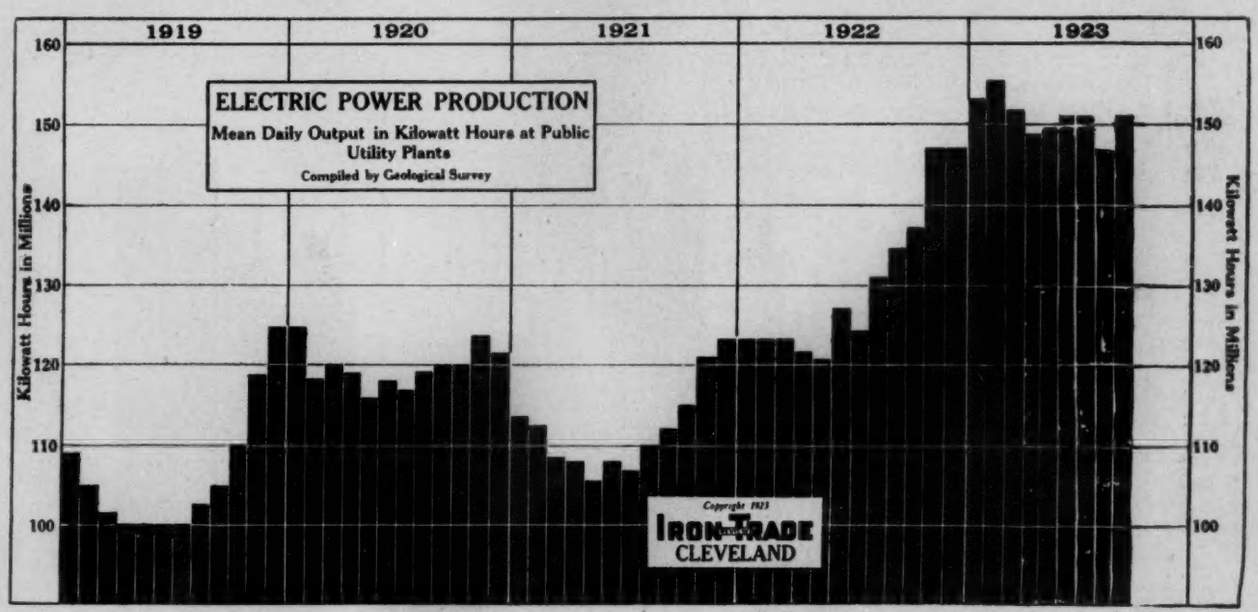
CLEVELAND
Square Feet in Millions
100
80
60
40
20


1919
1920
1921
1922
1923
ELECTRIC POWER PRODUCTION
Mean Daily Output in Kilowatt Hours at Public Utility Plants
Compiled by Geological Survey
Kilowatt Hours in Millions
160
150
140
130
120
110
100
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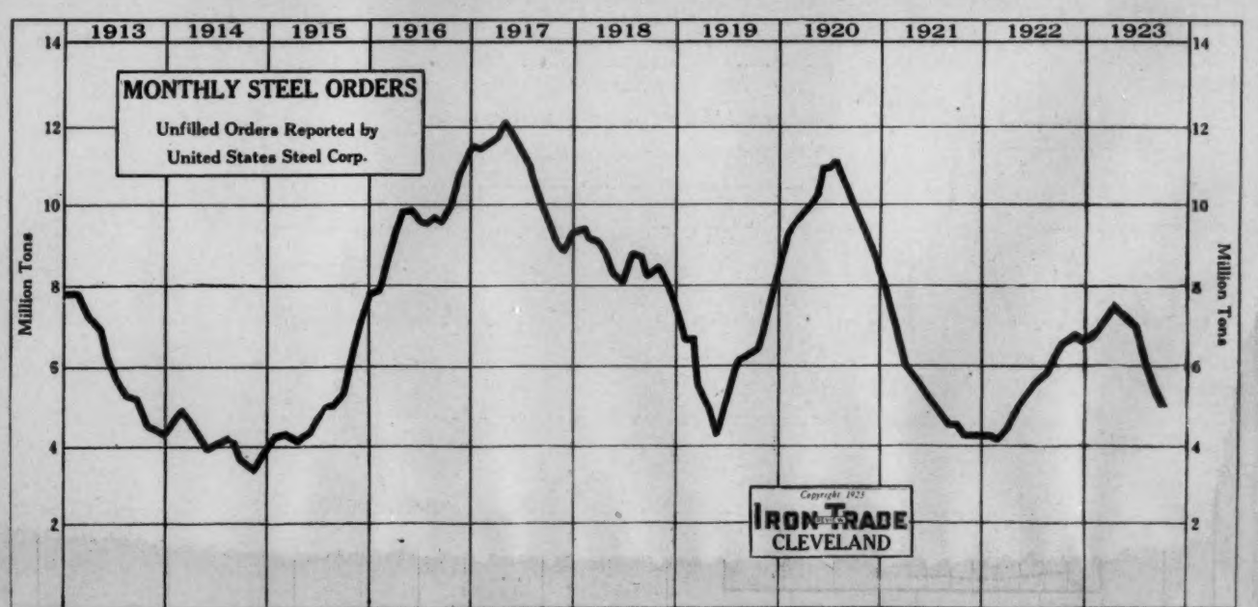
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
MONTHLY STEEL ORDERS
Unfilled Orders Reported by United States Steel Corp.
Million Tons
14
12
10
8
6
4
2
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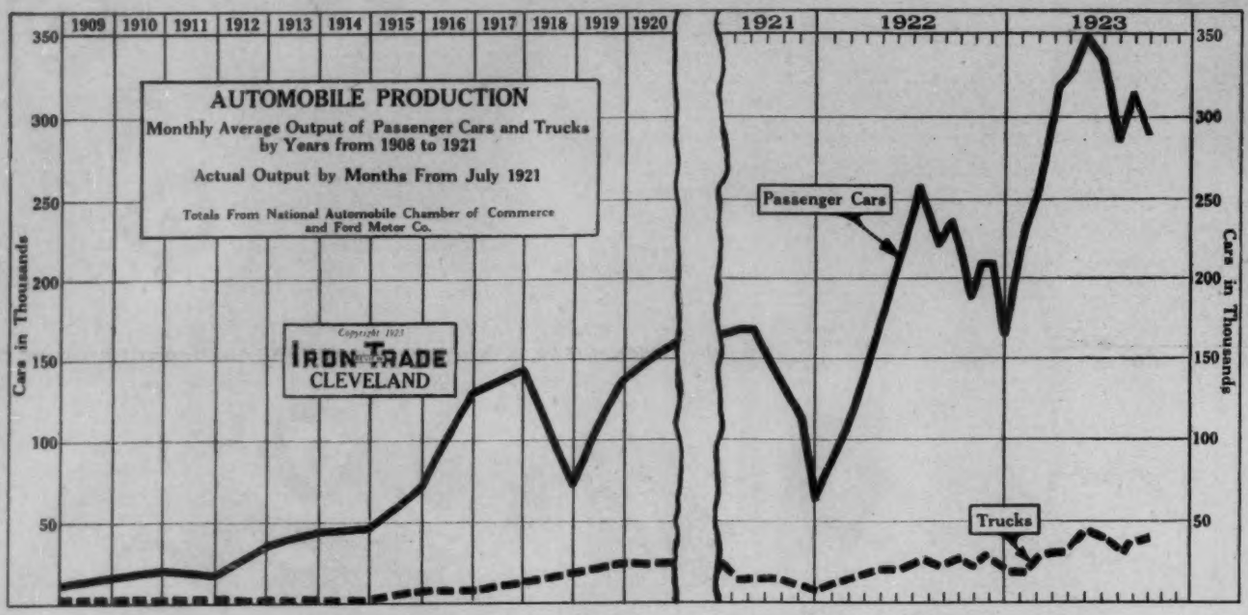
CLEVELAND


1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920
1921 1922 1923
AUTOMOBILE PRODUCTION
Monthly Average Output of Passenger Cars and Trucks by Years from 1908 to 1921
Actual Output by Months From July 1921
Totals From National Automobile Chamber of Commerce and Ford Motor Co.
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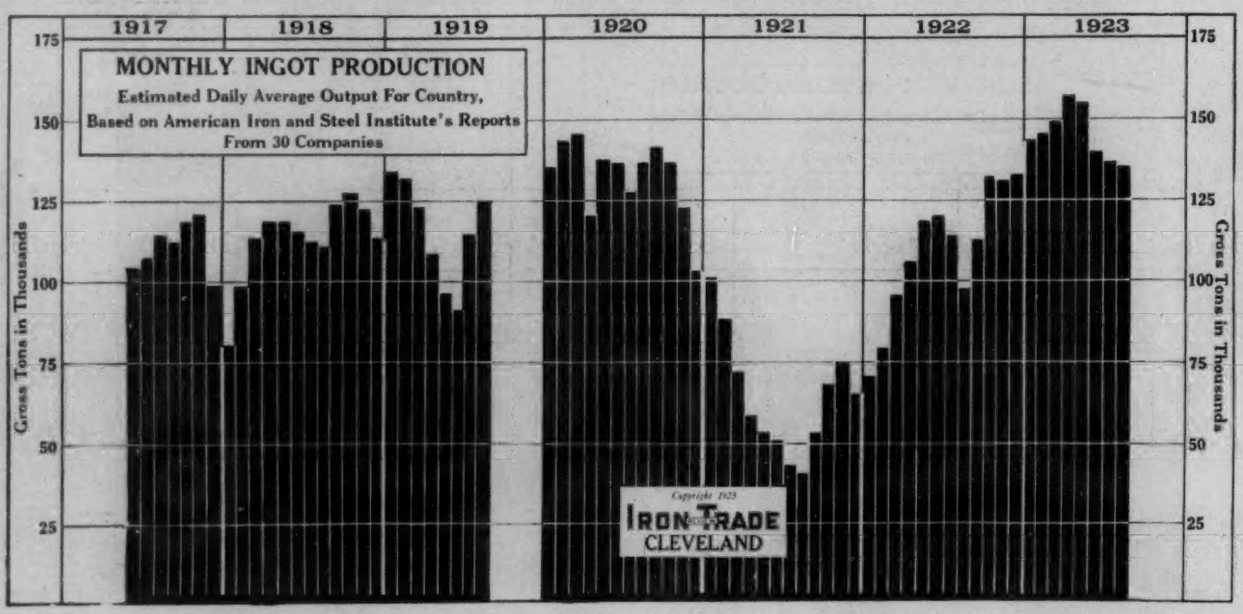
CLEVELAND
Passenger Cars
Trucks
Cars in Thousands
350
300
250
200
150
100
50


1917 1918 1919 1920 1921 1922 1923
MONTHLY INGOT PRODUCTION
Estimated Daily Average Output For Country, Based on American Iron and Steel Institute's Reports From 30 Companies
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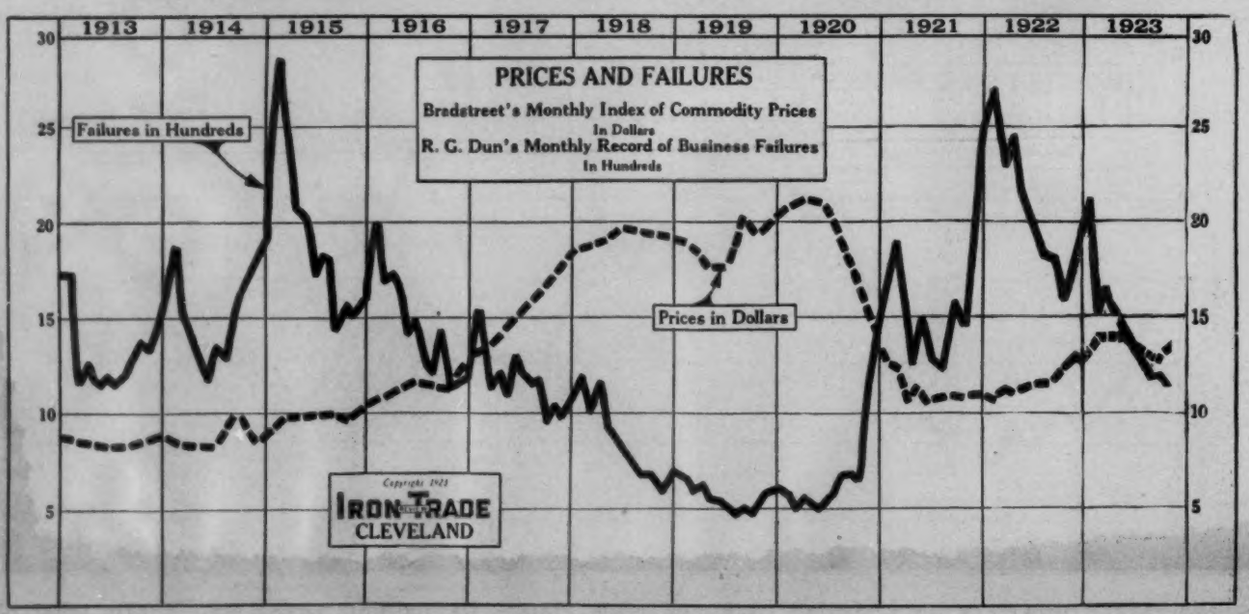
CLEVELAND
Gross Tons in Thousands
175
150
125
100
75
50
25


1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
PRICES AND FAILURES
Bradstreet's Monthly Index of Commodity Prices
In Dollars
R. G. Dun's Monthly Record of Business Failures
In Hundreds
Failures in Hundreds
Prices in Dollars
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30
25
20
15
10
5

Fig. 1—Artillery Park at Aberdeen Proving Ground Showing 155-Millimeter Guns in Storage

Aberdeen Proving Ground

The United States Government Has Established a Vast Laboratory Covering 36,000 Acres in Maryland Where Explosives, Projectiles, Armor Plate, Guns and Gun Carriages, Artillery Mounts and Other Items of Ordnance are Tested Prior to Acceptance.

BY FRED B. PLETCHER

ABERDEEN—a comparatively new name in the long list of government reservations—is the site of the ordnance department's permanent proving ground. It is an outgrowth of the famous Sandy Hook ground and with its recently acquired and contemplated equipment will provide for all probable peace-time needs. The large caliber seacoast guns have been transferred from Sandy Hook, facilities for tests of powder and armor plate have been added, and the activities of other smaller grounds have been taken to Aberdeen, where more permanent buildings are being erected, temporary structures removed and the land graded.

The author is editorial representative at Washington of IRON TRADE REVIEW.

Reflection on the volume and extent of the work being done at Aberdeen brings home the necessity for a large proving ground. The need for making essentially dangerous weapons safe to handle requires more prolonged and careful testing than is the case with most manufactured products. To test a single type of gun carriage alone, 50,000 shots were fired at Aberdeen. Many thousand rounds are required even to test a single design of fuse.

A sample of every lot of ordnance material manufactured must be tested

FIG. 2—A 12-INCH HOWITZER ON RAILROAD CARRIAGE. NOTE FLOATS ON GROUND LEVEL AND EARTH USED AS FLOAT BACKINGS

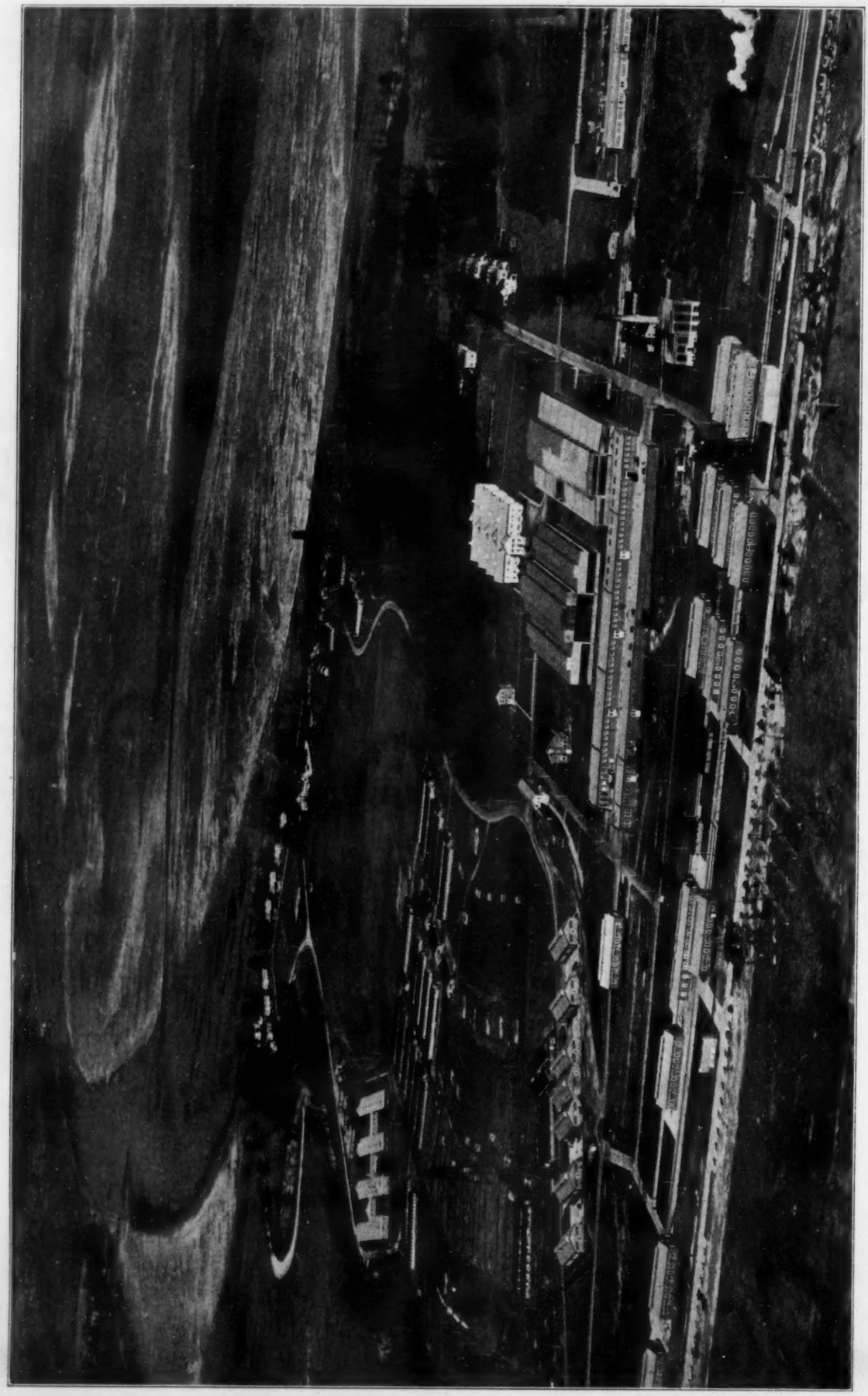


FIG. 3—GENERAL VIEW OF ONE SECTION OF ABERDEEN PROVING GROUND. THE WHITE BUILDING WITH COLONIAL COLUMNS IS THE ADMINISTRATION BUILDING. THE LARGE STRUCTURE AT THE LEFT AND IN FRONT OF THE ADMINISTRATION BUILDING IS THE MUSEUM AND THE BUILDING AT THE RIGHT IS THE MACHINE SHOP

to determine whether it conforms to specifications. However reliable a manufacturer is known to be, defective ammunition is possible and the lives of the country's soldiers must not be jeopardized by allowing any of it to go untested. Before guns and ammunition can be placed in active service where the success of battle and the lives of men depend upon their effectiveness, it must be ascertained that they are capable of doing their part of the work. The guns must be able to stand the stress of repeated firing and the shells must accomplish what is expected of them.

Efficient testing of guns and ammunition first of all requires a proving ground of considerable area. A vast workroom must be provided for deciding problems of gun construction; where stresses and strains, screen distances and powder charges, and range tables can be studied with a thoroughness that would give pause to the most brilliant scientific mind. Moreover a water front is necessary for testing naval guns and seacoast mounts, and in addition to these chief requisites, the site must be easily accessible from the chief manufacturing centers of the country.

Site Near Industrial Centers

Since many of the leading industrial plants are in the East, it was decided that a convenient location would be somewhere on the eastern coast. The commission appointed in Washington to choose a location for trying out war materials, which were to be manufactured in the United States, considered possible sites where extensive acreage was available.

The site finally chosen, which was destined to become the location of the largest proving ground in the world, was selected in Harford county, Maryland, which prior to 1917, was only a bare tract cris-crossed by curving country roads. It is about two hours' ride from Washington, two from Philadephia, and four from New York. The land of the reservation extends from Spesutie island in Chesapeake bay, to the Gun Powder river, and is between the mouths of the Bush and Susquehanna rivers. The extreme length of the reservation is 15 miles, with a maximum width of four miles, giving not only excellent sites for barracks, parade grounds, living quarters and manufacturing, storage and magazines, but a clear land and water range of 50,000 yards.

That ample space was necessary so that operations would not interfere with each other can be realized when one sees the trench warfare range, where an immense amount of firing at short ranges is carried on, the main battery where nonexplosive projectiles are fired to test powder and guns, the water range where the splashes made by falling projectiles are spotted by observers, the detonating ranges where officers watch bursting shells from bomb-proofs close to the line of fire, and the recovering fields where shells fired in the morning can be dug up later in the day.

Because of the dangerous character of most of the activities, it is necessary to allow wide margins of territory for safety. An antiaircraft shell bursting at a height of 10,000 feet scatters fragments over a large area, while a bursting gun or a major caliber shell striking an armor plate may project a fragment to the distance of a mile.

What Aberdeen Means To Manufacturers

PRODUCERS of iron and steel and manufacturers of equipment used by the United States army and navy during the war are thoroughly familiar with the high standards of quality demanded by the government for ordnance materials. However, many of them doubtless do not fully understand why absolute adherence to specifications is so strictly enforced. The activities of the ordnance department at Aberdeen explain the necessity for the seeming severity of the specifications, and it is because officers of that department want manufacturers to become more familiar with the tests to which their products are subjected that the members of the American Iron and Steel institute have been invited to visit the Aberdeen proving ground next Friday.

Believing that manufacturers in general, and particularly those who expect to visit Aberdeen, will be interested in the developments that led up to the establishing of the world's greatest proving ground. IRON TRADE REVIEW *presents in the accompanying article a brief outline of the history, scope of present activities and future possibilities of the Aberdeen reservation.*

The trip to the proving ground will be made by members of the institute leaving New York by special train Thursday night. Besides the institute guests, a number of other distinguished visitors are expected. It had been planned to include President Calvin Coolidge, but it is unlikely that he will be able to leave his official duties. Gen. John J. Pershing has been invited, and the war department also will be represented by the secretary of war or the assistant secretary. Maj. Gen. C. C. Williams, chief of ordnance, United States army, will be one of the official hosts.

Demonstrations of all forms of artillery and army ordnance, tanks and bomb dropping will be a part of the program. Airplane feats also will be included, and it has been the hope of the ordnance association to add a demonstration by the new giant Barling bomber, a "Leviathan of the Air."

Ten Millions Invested

For purchasing and developing the reservation, $7,000,000 originally was appropriated. Of this amount, about $3,438,776, was for construction work and material, and, based upon an army of 3,000,000 men, an estimate was submitted to congress showing $8,480,000 additional funds as necessary for further construction. At the present time more than $10,000,000 has been invested in construction.

On Nov. 17, 1917, the work of laying out the Aberdeen proving ground was begun. A principal firing range was laid out from the northern end of the reservation in a direction to cross Poole's island, in the bay, thus obtaining the maximum possible land range.

The main battery or front was located at right angles with the line of fire at a point just far enough down the range to give ample room behind it for offices, quarters, storehouses and a parade ground.

The firing at Aberdeen is done on five parallel ranges, each devoted to a particular class of work. They are laid out in such a way that there is available a range on land of 15 miles and a clear range of water of 40 miles. The first shot at the reservation was actually fired on Jan. 2, 1918, in a heavy snow storm. All the mobile guns were transferred from Sandy Hook immediately and from that time on proof work at Aberdeen went on in rapidly increasing volume. In January, 1918, about 4500 rounds were fired, and in February about 9000 rounds were fired. Before long, 50,000 rounds a month were being fired.

Activities in 1918 Strenuous

In the early months of 1918, proof firing was done on a small scale in the face of the greatest difficulties, but each day the scope of the work was increasing. A railroad from Aberdeen, Md., the nearest town, had been built to the proving ground, and as rapidly as possible tracks were extended to the front and to other parts of the grounds.

One of the greatest difficulties encountered in early proof work was the lack of chronographs, or velocity instruments. Many months were required for manufacturing the standard

FIG. 4—AN 8-INCH HOWITZER ON CATERPILLAR MOUNT AT ABERDEEN. EXHAUSTIVE TESTS MUST BE MADE BEFORE A GUN OF THIS TYPE IS ALLOWED TO GO INTO ACTIVE SERVICE

types in adequate quantities and the supply was hopelessly deficient. Maj. A. J. Loomis, then a captain in charge of the development section, undertook to devise a cheaper type of instrument. With the assistance of the United States bureau of standards, he developed the Aberdeen chronograph in a remarkably short time. Its design and immediate successful installation on a large scale at Aberdeen must be rated as a notable achievement of the proving ground.

The proof work took a sudden spurt in July, 1918, more than 50,000 rounds being fired that month. The first United States guns on railway mounts passed inspection at Aberdeen late in the spring of 1918. The pilot, or initial, complete 8-inch railway mount arrived at Aberdeen about June 1, of that year, and shortly after the first 16-inch howitzer was tested.

Test Railway Guns

These guns were fired with different powder charges and at different angles with their tracks. They were "star-gaged" and disassembled; records were taken of the action of their recoil mechanisms; time studies were made on the operation of firing and in general they underwent searching investigation. Meanwhile more railways guns came in, and a new section of the proof department was organized to carry on the work, and the former quiet cornfields of Mullberry point presented scenes of ever increasing activity.

Camouflaging operations were started at Aberdeen almost as soon as the first railway gun appeared. This problem of rendering artillery invisible to enemy observers is one of the most fascinating of the newer scientific war problems and hardly a start has yet been made on its possibilities.

Another of the 14-inch naval guns was sent to Aberdeen early in that autumn for range firing with a new projectile. Still later the 12-inch gun, on a sliding railway mount, which was designed and built in 85 days, and the 14-inch army gun came for tests and range firing.

Aviation was added to the proving ground activities in midsummer of 1919 by the arrival of the 271st aero squadron from Ellington field. A landing field was prepared and hangars and shops to the value of more than $1,000,000 were built. A bombing field was chosen, where high explosive bombs could be dropped without harm to lives or property. Here the aviators have dropped many hundreds of experimental bombs.

Other purposes were served by the aviators, however, besides the bomb dropping. They carried aloft meteorological instruments and observers who determined conditions in the upper air lanes so that the results observed in range firing could be properly corrected to normal atmospheric conditions. Beginning in November, 1919, this service was performed three times daily and the results were used at Washington in making weather maps for the use of the mail planes as well as in the work of the range firing section.

The instrument section at Aberdeen was organized in 20 separate units, each with its distinct function. All photographic work, all velocity, time, and powder pressure measurements were made by this section and electrical drafting and surveying work was performed. In a year's time, the instrument section had made some 34,000 velocity measurements and had made about 2000 photographs. This section is housed in a permanent brick building and is in a good position to do research work as the pressure of routine work subsides.

Later the range firing section was formed to conduct firing and computations, to prepare range tables, which would allow for variations in atmospheric conditions and other factors. At one time college professors in mathematics were called in to direct the computing and to devise methods and theories.

How Ranges Are Determined

To measure the ranges of projectiles, an extensive system of 16 observation towers, stretching for 30 miles, has been built and equipped on the eastern shore of the bay. To carry men and material to and from the towers a number of boats were

needed, and a small "navy" was maintained by the proving ground, consisting of one 76-foot cruising yacht and a half dozen small motor boats.

Afterwards a detachment of the meteorological section of the signal corps was sent to Aberdeen, which accomplished much pioneering work in the study of conditions of the upper atmosphere as applicable to the artillery.

One of the most spectacular features of the development section was the testing of tanks and tractor. The ungainly caterpillar tractors were put through many tests in the Aberdeen mud and through the wooded areas.

Testing Fuses at Night

The testing of antiaircraft fuses formed the principal night activity at Aberdeen in the war days. Tests usually were conducted from midnight on. The star-like flashes of the fuses were visible for many miles as were the flashes of the blasts from the gun. More than 10,000 antiaircraft and more than 40,000 of other types of time fuses were tested at Aberdeen in 1918.

The acceptance section of the proof department performed all tests of manufacturers' samples during the war to determine the acceptance or rejection of the materials offered.

As a result of rotating band experiments, radical changes in band design of a number of projectiles used by the army have been made. Considerable work of this character was conducted at Aberdeen during the war.

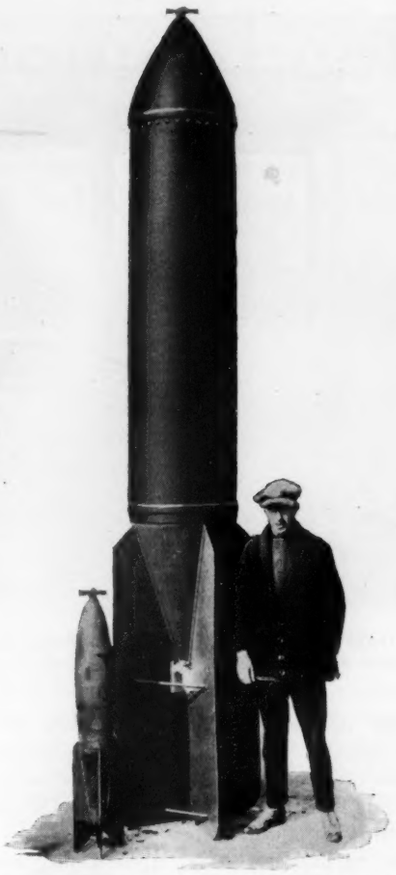


FIG. 6—A 4000-POUND DEMOLITION TYPE OF BOMB—FIRST OF THE LARGEST SIZE BOMB EVER PRODUCED. IT IS 13½ FEET HIGH AND 23 INCHES IN DIAMETER. TESTED AT ABERDEEN

Within a year Aberdeen grew from a bare tract of land to an artillery firing ground with nearly 10,000 inhabitants, 30 miles of railroad, 20 miles of concrete roads and its own water, power and lighting supply. The proving ground trained its own officers and supplied many to the other posts. It performed more firing than had been dreamed of before the war, the total of one day's rounds having reached 7676.

Work Done by Untrained Men

The work of the proving ground has been done by essentially untrained men, few of whom knew the elements of ordnance work before arriving at Aberdeen. Many of the reserve officers were graduate engineers, but few had any ordnance training prior to entering the ordnance school. The majority of the enlisted men had no special aptitude for ordnance work. All ranks were invaded by a strong desire to "go across" and a discontent at being kept on this side of the water.

It is hoped to make Aberdeen the center of ordnance activity and knowledge and to establish at it a good

FIG. 5—A 155-MILLIMETER GUN ON TRAILER MOUNT. RIGID SPECIFICATIONS COVER CASTINGS AND FORGINGS USED IN THE GUN CARRIAGE AND MOUNT

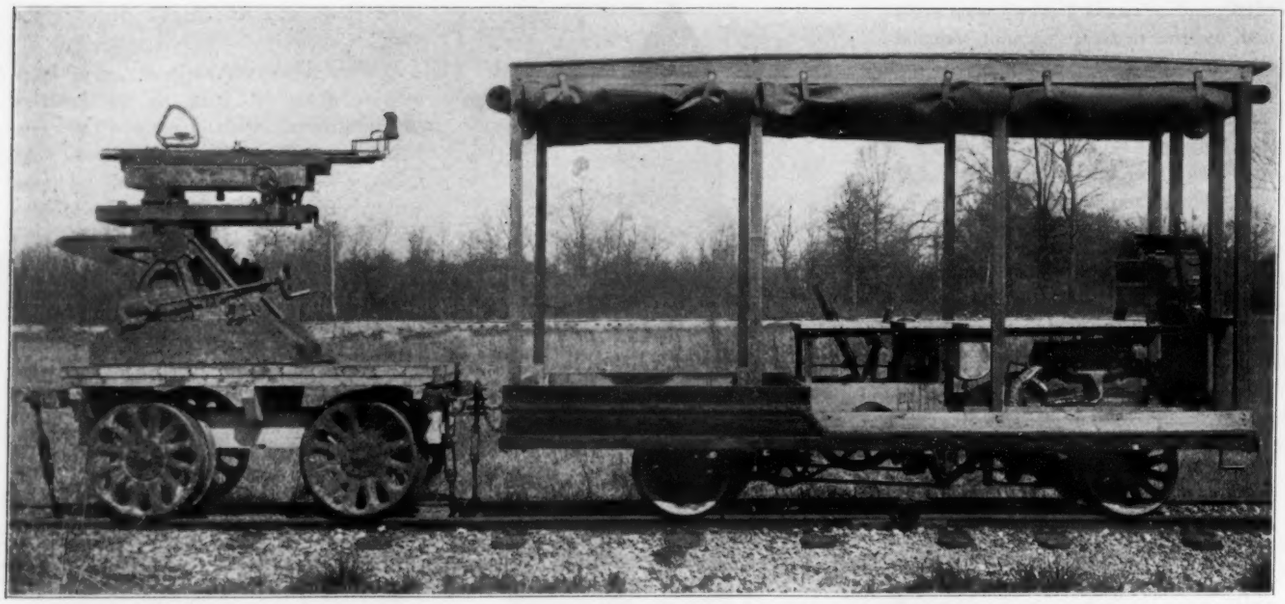


FIG. 7—NARROW-GAGE CAR DRIVEN BY FORD MOTOR CO. ENGINE AND TRAILER CARRYING 50-CALIBER MACHINE GUN. THIS EQUIPMENT IS USED FOR TESTING GUNS ON THE SMALL ARMS RANGE AT ABERDEEN

ordnance school for officers, an ordnance library and a permanent staff of experts, who will do research work leading to improvements in material.

The experiences of the war have indicated that a large number of untrained men can be gathered, and made into trained fighters more quickly than the suitable amount of ordnance equipment can be developed and manufactured.

It is the aim of the ordnance branch of the army to have the members of organizations such as the American Iron and Steel institute visit Aberdeen to view at first hand the undertakings and possibilities of this extensive laboratory. It is believed that as producers and manufacturers of the country are kept in touch with the requirements and functions of this branch of government service, the proving ground and ordnance department can be supplied more readily in cases of emergency.

Japan's Rehabilitation To Be on Large Scale

Reports of the devastation caused by the catastrophe in Japan place the number of demolished buildings in Tokio at 316,,000 or about 71 per cent of the total number in that city, according to the Far East division of the chamber of commerce. In Yokohama there are but 15,000 buildings left intact of the 85,000 that stood before the disaster.

The destruction in the outlying districts may bring the total of buildings destroyed up to the half million mark, the large majority of which are homes. This number, added to the housing shortage that existed in Japan before the earthquake, will necessitate the construction of dwelling houses on a large scale. Since Japan normally looks to the United States for about 60 per cent of its lumber requirements it is expected that the demand for American lumber during the reconstruction period will be very heavy.

The price of Japanese lumber delivered c.i.f. Yokohama or Tokio has been approximately 20 per cent higher than that of similar qualities of American lumber, and American freight rates have been favorable. The American market also finds itself in a favorable position as regards delivery. It often happens that the Japanese importer can secure delivery from Pacific ports to Yokohama in less time than from Hokkaido, Karafuto, or even from the northern provinces of Japan proper.

In comparison with our own homes, little wood is required for the construction of Japanese dwellings, in which paper, straw, matting, and tile for roofing play a large part.

Piling will be required in large numbers for reconstructing the destroyed docks and waterside warehouses and sheds in Yokohama and Tokio, as well as for building subfoundations for industrial buildings, bridge, and construction work in general. The city of Tokio for some time has contemplated the widening and straightening of its narrow, crooked streets, and many have already been designated for this improvement. This plan will no doubt be carried out in the reconstruction program and the widening of the streets will require enormous quantities of paving blocks

It is reported that plans are being made to rebuild Tokio and Yokohama along modern lines, conforming with the construction of the western world as closely as practicable. The possibilities along this line are somewhat limited, keeping in mind the probability of a recurrence of earthquakes and designing the buildings accordingly, and the necessity of keeping the cost within limits, especially in the case of homes. It is certain, however, that in a short time better and finer cities will rise from the ashes of Tokio and Yokohama and that they will regain their prominent positions in Japanese affairs.

Inquiries have been made already by the Japanese cities for supplies of copper and brass for use in reconstructing the devastated buildings. It is understood that the Japanese government has issued an order forbidding the use of heavy roofing materials and is endeavoring to obtain roofing of the lightest possible weight, which is at the same time fireproof and earthquake proof. The old custom of using heavy tiles for roofing will not be followed, the tiles having caused much damage during the recent earthquakes.

Tariff Sought in India

Representatives in London of the Tata Iron & Steel Co. have appeared before the tariff board organized recently by the Indian government demanding a duty on finished iron and steel products shipped to India of 33-1/3 per cent ad valorem. It was stated that the manufacture of iron and steel still is an infant industry in India and that although raw material is abundant and natural obstacles to the development of home production do not exist, it is impossible for Indian mills to establish themselves in the face of foreign competition without protection.

Burning Liquid Fuel Efficiently

Type of Burner and Design of Furnace Principal Factors in Economical Use of Fuel Oil—Refractories, Use of Insulating Brick, and Condition of Fuel Also Influence Efficiency

BY H. A. ANDERSON

BECAUSE a heat-producing device for liquid fuel can be built easily, oil is one of the most abused of industrial fuels. An oil burning appliance may be inefficient, but by using the fuel extravagantly fair results may be obtained.

Unfortunately the term "oil burner" often is loosely applied to atomizers, which merely spray the oil into the furnaces, which in turn must mix, gasify and burn the oil. A burner cannot rightfully be called a burner unless it actually completes the combustion of fuel without external aid; that is, it must be independent of the furnace. The function of a furnace is not to burn the fuel but to conserve and distribute the heat developed by the burner. The test of a real burner is its ability to completely burn the fuel in the open, without being applied to a furnace. To meet these requirements, a burner must atomize the fuel completely, thoroughly mix the finely divided oil with the correct amount of air, and then gasify the finely divided particles of oil and completely burn the gas. The gasification and combustion of the finely divided fuel must take place in a small area under high temperature, in order to obtain perfect combustion.

Vapor-Type Burner

Liquid fuel burners may be classified as the vapor, mechanical, spray, and combustion types. The vapor burner passes the fuel through or over a hot surface to convert the oil to a vapor or dry gas. This vapor is passed through a nozzle or allowed to escape from the hot surface and mix with atmospheric air, usually induced into the furnace by stack draft. Frequently a small blower is used to aid the stack draft. This type of burner will operate only on the light fuels, such as kerosene, distillate and some grades of furnace oil. Its capacity is limited by the rate of vaporization of the hot surface. More or less difficulty is experienced in controlling the temperature and atmosphere with this type of burner. The generating surfaces frequently collect carbon due to the cracking of the fuel, thus reducing the capacity of the burner and sometimes clogging it up entirely. The field of this burner is limited largely to small-capacity installations, such as portable torches and domestic heating apparatus. The big problem is to control the temperature of the vaporizing surface and to mix the air and vapor properly.

Burners of the mechanical type atomize the fuel by passing it through small orifices under high perssure. The orifices usually are placed tangentially to expansion chamber to induce rapid rotation, which with the velocity atomizes the fuel and helps to mix the finely divided oil with air. The air required for combustion is drawn in the furnace chamber through small ports around the burner by the effect of the stack or pressure set up in the furnace room.

This type of burner is used in the marine service because it requires little auxiliary equipment. It is not well adapted for industrial heating because the operating range is narrow, but is suited to capacities of 50 gallons per hour and over. A new type of mechanical burner is the rotating cup atomizer. The oil is fed into the rotating cup by a small stationary tube and the cup is rotated by an electric motor or by a blast of air that passes vanes on the periphery.

The spray burner is the atomizing device used almost universally in the industries. Atomization is accomplished by passing the oil through a nozzle in the path of a jet of air or steam. The velocity of the air or steam divides the oil into a spray, which is passed into the furnace for combustion. The velocity of the spray induces additional air for combustion. This type of burner can be classified as follows:

1. High pressure burners operating on air or steam usually at between 50 and 125 pounds per square inch.
2. Medium pressure burners operating on air pressure at from 1 to 15 pounds.
3. Low pressure burners operating on air at between 6 and 14 ounces.
4. High-low pressure burners atomizing oil with high-pressure air and using low-pressure air for combustion.

The closed type combustion chamber operates on low pressure air which atomizes the oil and supports combustion. The burner does not induce any atmospheric air; consequently there is no induced air variable to contend with in balancing fuel and air. The oil is atomized over knife edges located in the jet of air to thoroughly mix the air and fuel for combustion.

The first stage of combustion is gasification, which takes place under high temperature due to the small volume of the combustion chamber. This chamber is lined with refractory material which stores heat and radiates it back to the atomized oil for gasification. A secondary supply of air then is fed into the partially burnt gases, completing combustion within the burner. From the foregoing it is clear that the fuel and air entering this type of burner is under control, therefore, the correct balance is easily obtained and a fully expanded, hot gas is distributed throughout the furnace.

Three Types of Furnaces

At the present time the oil burning furnaces in general use are of three types—under-fired, over-fired checkered arch, and side trench-fired furnaces.

In the under-fired furnace the combustion space is below the furnace hearth. This space must mix, gasify and burn the oil and then deliver it to the heating chamber above. The high temperatures of combustion under the tile floor of the furnace greatly reduce the life of this floor which frequently fails during operation, dropping the complete charge into the combustion chamber. The large combustion space increases the heat loss of the furnace and tends to reduce the efficiency of combustion.

The most common method of venting the under-fired furnace is to place a row of openings in the furnace arch. Another method is to use ports in the rear wall, which tends to equalize the temperature in the rear zone of the furnace. Still another method provides vents in the rear wall and door, giving a fairly good circulation of heat with a small low charge.

In the over-fired checkered arch type of furnace the combustion space is above the heating chamber. The atomized mixture is directed against a flash wall for reducing its velocity and further mixing it for combustion. The products of combustion fill this space and escape through the many ports in the arch down to the

From a paper presented before the Southern and Southwestern Railway club, Atlanta, Ga., Sept. 20, 1923. The author is chief engineer, Mahr Mfg. Co., Minneapolis.

heating chamber. In this type of furnace the vents are placed along the side walls at the height of the furnace floor. The temperature ordinarily is uniform with small low charges but with heavy charges the heat tends to take the path of least resistance and flows directly to the vents, due largely to the lack of forced circulation. The rate of heating usually is slow because of the large amount of brick that must be heated in the combustion chamber above.

In the trench-fired furnace the combustion chamber is arranged along one side of the furnace, the vents usually being located on the opposite side in order to carry the hot gases over the material to be heated. This type of furnace has the same general characteristics as the under-fired furnace. Temperatures vary considerably from the bridge wall to the opposite side, the areas next to the wall frequently being cold as compared to those on the vented side. To remedy this condition wide furnaces sometimes are fired from both sides and vented in the arch or rear wall.

Permits Close Control

The over-fired open chamber furnace is recognized as an efficient and fast heater. When equipped with a proper number of combustion type burners rapid heating and high efficiency can be obtained and the temperature and atmosphere can be controlled within close limits. For example, small heat treating furnaces of this type can be expected to operate within 5 degrees, plus or minus, and moderate sized car-type furnaces should operate within 10 degrees, plus or minus, in the same plane of the charge.

Since the walls are exposed only to temperatures slightly above the desired heating temperature the life of linings in this type of furnace is comparatively long. In the case of a heat treating furnace the life of a tile floor is determined by the actual wear of charging and discharging. The tile does not burn out. Practically the only refractories in the furnace that require replacement are in the lining of the combustion-type burner, the life of which varies with the service the furnace is required to perform. In heat treating and annealing furnaces the life of the burner lining ranges from one to two years. In forging and welding furnaces where higher temperatures are required the life is from six months to one year.

At the present time most forging furnaces are either over-fired into an open chamber or under-fired in a similar way, the ordinary spray-type burner being most generally used. The nature of forging work is such that scaling, decarbonizing and pitting can be contended with to a certain extent without causing rejections. The principal factors affecting efficiency are the design of the furnace and selection of a suitable burner. The relative influence of furnace design and proper selection of burner was indicated recently in a test conducted at a Chicago plant. The tests were made on an old furnace having high-pressure burners and an average output of 49 pounds of steel per gallon of oil. The furnace design was then changed to conform with the combustion chamber design, the old high-pressure burner being retained. This change in design increased the output to 62.5 pounds per gallon of oil. After the combustion-type burner had been substituted for the old high-pressure burner the output was increased to 72.2 pounds per gallon of oil. In this case proper furnace design showed a greater saving than the application of a combustion-type burner.

Another important factor in the construction of a furnace is the quality of refractory material used, since the efficiency of the furnace depends to some extent on the amount of heat lost through the furnace walls. Ordinary firebrick has a certain insulating as well as refractory property which is measured in terms of the number of B.t.u.'s conducted by one square foot of surface 1 inch thick per degree of temperature per hour. This unit, which is known as thermal conductivity, in the case of average firebrick is between 10 and 12. Many different insulating materials are manufactured for further reducing furnace losses but as many of these are not refractory they must be placed in back of the firebrick. The average thermal conductivity of these insulating brick is about 1. In other words a 1-inch wall of insulating material is equal in thermal conductivity to about 10 inches of firebrick. Insulating brick pays high returns on furnaces operated continuously but shows small if any savings on furnaces used only a few hours each day because the heat would scarcely penetrate the firebrick in that short period.

Furnaces used for high temperatures such as welding accordingly should not be insulated as the firebrick needs to be exposed to the air for cooling in order to keep it below its melting point.

The color of the surface also is a factor in the heat loss of a furnace. Dark colors, such as black, sometimes radiate enough heat to balance the retarding effect of the insulating brick used in the furnace wall. Light colors including white and light grays, radiate little heat. Light shades of gray are commonly used for industrial furnaces.

Low-pressure air has several marked advantages over high-pressure air in combustion type burners. The cost of producing the air is lower; the refractory lining lasts longer with low-pressure air and the low hum of a low-pressure burner sometimes is considered preferable to the deafening roar of the high-pressure burner.

Keep Oil Free From Dirt

The oil used should be sufficiently fluid to atomize and flow freely. It should be free from dirt and other foreign matter, as these impurities seriously interfere with the proper regulation of fuel in the furnace. The control of oil at low capacities is exceedingly difficult unless the fuel is clean and properly strained before going through the regulating valve. The clogging of an oil regulating valve throws the furnace out of balance, reduces the temperature and changes the furnace atmosphere.

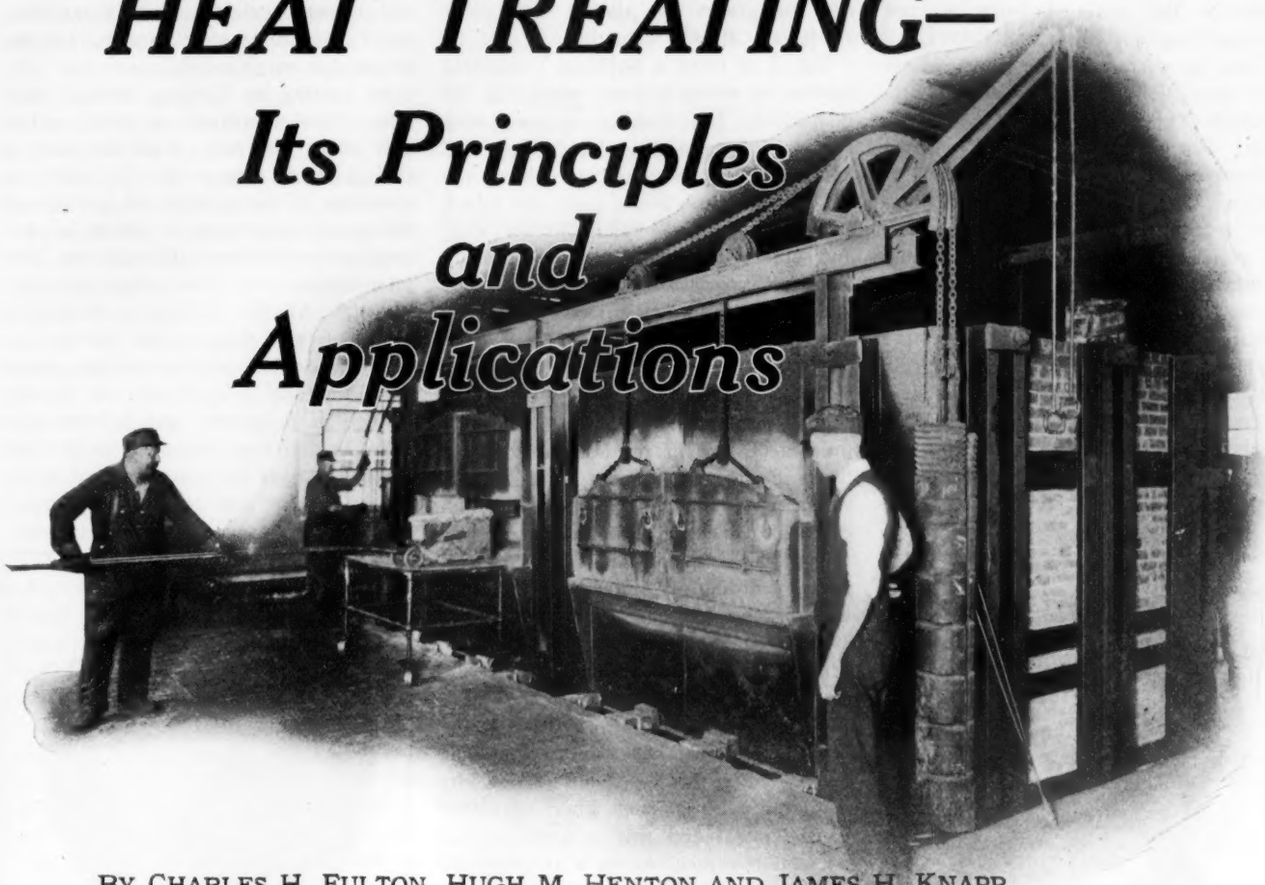
Excessive oil pressures should be guarded against as they have a tendency to cause clogging at the regulating valve. Moreover, high pressures require less opening of the valve, hence small particles easily clog it. For average fuel oil a pressure of 30 pounds per square inch is sufficient. If the fuel is heavy the best way to reduce the viscosity is by a steam heater. The oil also may be heated by running steam pipe lines alongside the oil line. Another method is to place the oil feed line over the furnace vents. However, this method does not take care of the starting period, it being necessary to use a torch to apply heat to the oil line and strainer for starting.

It is not good practice to reduce the viscosity of heavy oils by mixing with lighter oils because it is almost impossible to obtain a thorough mix. When the oil is not properly mixed a greater amount of thin oil will pass the valve than heavier oil, the result being a pulsating flame which causes the furnace temperature and atmosphere to vary.

There are four methods of feeding liquid fuel to the burners. These are known as the pressure, gravity, standpipe and circulating systems. Perhaps the most commonly used system is the pressure or dead-end system. Pressure is applied to the tank to force the oil to the various pieces of burning equipment. Heavy fuels are difficult to

(Concluded on page 1105)

HEAT TREATING—
Its Principles and Applications



BY CHARLES H. FULTON, HUGH M. HENTON AND JAMES H. KNAPP

Chapter II—The Structure of Iron and Steel

A PURE metal, iron for example, is made up of a large number of grains of crystals. A crystal consists of a group of molecules or particles arranged in a definite order about a system of axes. When allowed to grow freely from a solution, or material in the molten state, its surfaces will be bounded by planes which are usually many sided polygons, a definite crystal form being the result. Common examples are alum crystallizing from its saturated solution, or ordinary rock candy, produced by permitting crystallization on strings hung in a saturated sugar solution. Crystal growth starts from a center or nucleus. When, in a solution or a molten metal at the freezing point, crystallization starts, there will be many closely adjacent centers of crystallization or nuclei and numerous crystals will grow from these centers throughout the freezing range of temperature. The growth is around definite axes of which the nucleus is the intersection or center. Most metals crystallize in the isometric or cubic system, in which the axes are of equal length and at right angles to each other. The directional position or orientation of the axes of the many crystals that are forming will be different, so that the crystals grown from different centers or nuclei will intersect when they meet and the formation of the normal crystal face or surface will be prevented and the exterior of any given crystal will be determined by its immediately adjacent neighbors. The crystal (*known as an allotrimorphic crystal) differs in no way in structure from the normal crystal, except in exterior shape. It now becomes known as a "grain".

The final structure of the metal is an aggregate of grains, which are differently oriented. The boundaries of the grains usually are roughly polygonal. If a piece of pure iron is highly polished and then examined by the metallographic microscope (by reflected light) it will be found to present a uniform, nondifferentiated surface in which no grain structure is visible. If, however, the polished surface is cleaned free of grease by alcohol and then immersed for a few moments in a 2 per cent solution of nitric acid, then washed in water and dried rapidly with alcohol, a definite structure becomes apparent under the microscope. Bringing out this structure is called etching. The depth of the etching depends on the reagent used and the

A Complete Text Book in Serial Form

AS OUTLINED in the issue of Oct. 4, "Heat Treating—Its Principles and Applications" is a complete treatise on heat treating, of which the accompanying article is the second of 18 installments.

The work is the result of the experience of three competent authors. Charles H. Fulton is director of school of mines and metallurgy, University of Missouri; Hugh M. Henton is consulting metallurgical engineer and assistant professor of metallurgy and mining, State College of Washington, and James H. Knapp is furnace engineer, Tate-Jones & Co., Pittsburgh.

The next installment will appear in the issue of Nov. 1.

time. Light etching will bring out distinctly the grain boundaries, and more prolonged etching will form small pits on the surface of the grain. These pits have definite shape and depth, dependent on the orientation of the grain: For instance, if the polished surface of the grain is parallel to two of the axes of grain, the pits will appear as little squares, but if the polished surface of the grain cuts all three of the axes, the pits will appear as little triangles under high magnification. The etching pits are similarly oriented in any given grain and differently oriented in adjacent grains. When a polished and etched specimen of metal is placed under the microscope, the grain boundaries are clearly defined and some grains appear light and others dark in varying degree. This is caused by the different amount of light reflected to the eye-piece of the microscope by the several grains, due to the difference in the etching pits and their orientation. If a grain is so oriented that the etching pits are little cubical depressions (square sections on surface) the light is reflected vertically from the surface to the eye-piece and the grain appears light. If, however, the grain is so oriented that the etching pits are little pyramidal depressions (triangular sections on surface) much less or little light is reflected to the eye-piece and the grain appears dark. Dependent on the exact orientation, grains vary in many shades between light and dark. On revolving the metal specimen horizontally under the microscope, some of the grains pass from dark to lighter or vice versa as the orientation in regard to light rays is changed by the revolution.

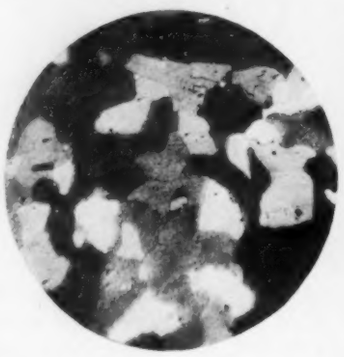


FIG. 1—COMMERCIALLY PURE IRON

Magnified 150 diameters to show grain structure. The light and dark grains are determined by the difference in orientation. (Jeffries)

Fig. 1 is reproduced from a polished section of pure iron. The grain boundaries and the different orientation of grains as shown by color shade are clearly brought out.

Fig. 2 is from a polished transverse section of wrought iron, magnified 150 diameters. The etching is not deep enough to produce marked pitting and hence the grains do not show the color shadings. Some of the dark spots are foreign inclusions of slag, and others are small areas of pearlite which is referred to further on. The grain structure of the metal is plainly shown.

Object of Heat Treatment

The subject of grain structure is presented here in some detail because the size and arrangement of this structure can be changed by means of mechanical work and heat treatment and the physical properties of the metal thus profoundly influenced. In the use of iron and steel for tools or as a structural material special physical properties, such as tenacity, high elastic limit, hardness. etc., are sought. The degree of these properties is largely inherent in the material but can be varied within a wide range by changing the internal grain structure of the metal and this is accomplished by heat treatment or by heat treatment combined with mechanical working of the metal.

Pure metals like iron or alloys of metals which are completely soluble one in the other in the solid state, thus forming solid solutions, consist of homogeneous masses of crystal grains, which are alike in composition and differ from each other under the microscope only in respect to orientation and size.

However, when two metals like copper and silver, or a metal and a nonmetal such as iron and carbon, which are not completely soluble in each other in the solid state and in the liquid state only in certain proportions are alloyed together and become solid, the mass will consist of a mixture or conglomerate of grains of different substances which are not the original constituents, but combinations of the original constituents. The structure of the alloy is still crystalline and made of grains, but several kinds of grains are present, and the structure is much more complex.

The average grain size of a metal or alloy is initially determined by the slowness or rapidity of cooling through the freezing range of temperature. Fast cooling through this range gives rise to small grains, while slow cooling gives large grains. In general, the fine grained state of a metal is superior to the coarse grained state in that such mechanical properties as tensile strength, elastic limit, elongation, and resistance to shock and fatigue are of greater magnitude.

In heating or cooling through certain critical temperatures some metals and alloys as pure iron or steel, a change takes place in the internal structure of the crystals or grains and the newly formed grain differs in physical properties from the old one. This phenomenon is known as polymorphism.* At the critical temperatures at which the polymorphic change occurs there is a complete rearrangement of structure and hence a decided change in properties, and it is to these changes that heat treatment is directed. These changes in structure and properties of iron and steel will be taken up in detail in subsequent installments.

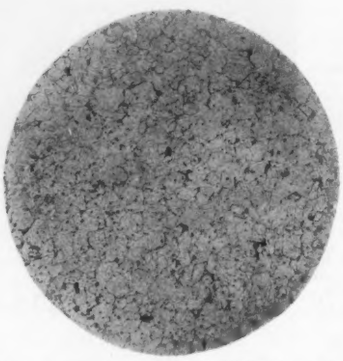


FIG. 2—TRANSVERSE SECTION OF WROUGHT IRON

Magnified 150 diameters to show grain structure. The dark spots are mostly slag, but some are pearlite. (Herman Holz)

The grain size of metals and alloys also may be varied by heat treating the previously mechanically worked metal. It is a well known fact that the cold working of metal greatly increases the tensile strength and hardness, as for instance the drawing of steel into wire multiplies the strength many times. A steel of 0.83 per cent carbon and 0.60 per cent manganese having in the annealed state a strength of 124,000 pounds per square inch when drawn into wire of different diameter increases in tensile strength as follows:

Diameter of wire, inches	Breaking strength in lbs. per sq. inch
0.191	191,600
0.159	224,000
0.132	257,600
0.093	344,960

This great increase in strength is ascribed by modern research to the production of amorphous metal from

*If the change involves the rearrangement of molecules in a crystal. If the change is more profound and involves the rearrangement of atoms in the molecules it is called allotropy.

the breaking down of the crystalline grains. The amorphous state of a metal usually is understood to mean the noncrystalline solid state of the metal. The general crystalline structure of metals and the manner of growth of the crystal grains has been described. It is thought that the grain grows by the addition of crystal units which consist of a group of molecules, and as the crystal growth is completed and the grains join, there will be left a certain amount of material which cannot crystallize and, therefore, remains unorganized or amorphous. The grains, therefore, are surrounded by a network of this material known as the amorphous cement. The metal, therefore, is present in two forms or phases, the crystalline phase and the amorphous phase.

These two phases of the metal have different physical properties for instance the tenacity of the amorphous phase is greater than that of the crystalline phase below a certain temperature known as the equi-cohesive temperature (Jeffries) while above this temperature the crystalline phase has the greater tenacity. Each metal or alloy has its specific equi-cohesive temperature. For iron it is 550 to 600 degrees Cent., 1022 to 1112 degrees Fahr.

Effect of Mechanical Working

When a metal is plastically deformed by hammering, rolling or other mechanical working in the cold, motion takes place within the grains along certain planes, the result of which motion is evident under the microscope in the formation of the so-called slip-bands. The sliding on these planes produces amorphous metal from crystalline metal by attrition and the more the metal is worked the larger is the amount of amorphous metal produced. Since the amorphous state is the strongest one at ordinary temperatures the worked metal is stronger than the unworked metal. The ductility (the property of being drawn or elongated greatly without rupture) of the amorphous phase of a metal is less than that of the crystalline phase, and in severely cold worked metals it therefore is necessary to anneal between workings.

In annealing it is necessary to heat the metal to the recrystallization or equi-axing temperature which in general is about the same as the equi-cohesive temperature. At this temperature the crystalline matter in the grains commence to absorb the amorphous material and the grains grow. Larger grains at the equi-axing temperature absorb the material of smaller grains for the probable reason that the heat energy evolved by the absorption of amorphous material by the growing grain is available to produce new amorphous material from the organized material of the smaller grain, which is then absorbed by the large growing grain.

This is the basis for two rules on the control of grain size:

1. The recrystallization temperature for any metal varies with the amount of cold work to which it was subjected. The greater the amount of work, resulting in the largest amount of amorphous material, the lower will be the recrystallization temperature.

2. The grain size obtained in a piece of metal by heating to any temperature above the recrystallization temperature depends largely upon the rate or speed at which the metal is heated to that temperature, and particularly on the rate at which the recrystallization temperature is passed. The faster the heating rate the smaller will be the grain size.

To produce the smallest possible grain size the metal should be heated quickly to a temperature just above the recrystallization temperature. An increase in temperature will produce further grain growth.

To produce coarse grains the metal should be heated to the recrystallization temperature range and held there for an extended period of time. In some cases the coarse grain thus formed will not increase on further raising the temperature. Usually the final coarse grain can be obtained in

Table V

Nomenclature of Critical Points

		Known as
1.	Change of *Gamma* to *Beta* iron	A_3
	Change of *Beta* to *Gamma* iron	
2.	Change of *Beta* to *Alpha* iron	A_2
	Change of *Alpha* to *Beta* iron	
3.	Exact equilibrium *temperature for A_3 is 917 degrees Cent. (1683 degrees Fahr.)	Ae_3
4.	Exact equilibrium temperature for A_2 is 768 degrees Cent. (1415 degrees Fahr.)	Ae_2
5.	Change of *Gamma* to *Beta* on cooling is at 904 degrees Cent. (1659 degrees Fahr.)	Ar_3
6.	Change of *Beta* to *Gamma* on heating is at 935 degrees Cent. (1715 degrees Fahr.)	Ac_3
7.	Change of *Beta* to *Alpha* on cooling is at 768 degrees Cent. (1415 degrees Fahr.)	Ar_2
8.	Change of *Alpha* to *Beta* on heating is at 768 degrees Cent. (1415 degrees Fahr.)	Ac_2

*H. M. Howe, *Metallography of Iron and Steel.*

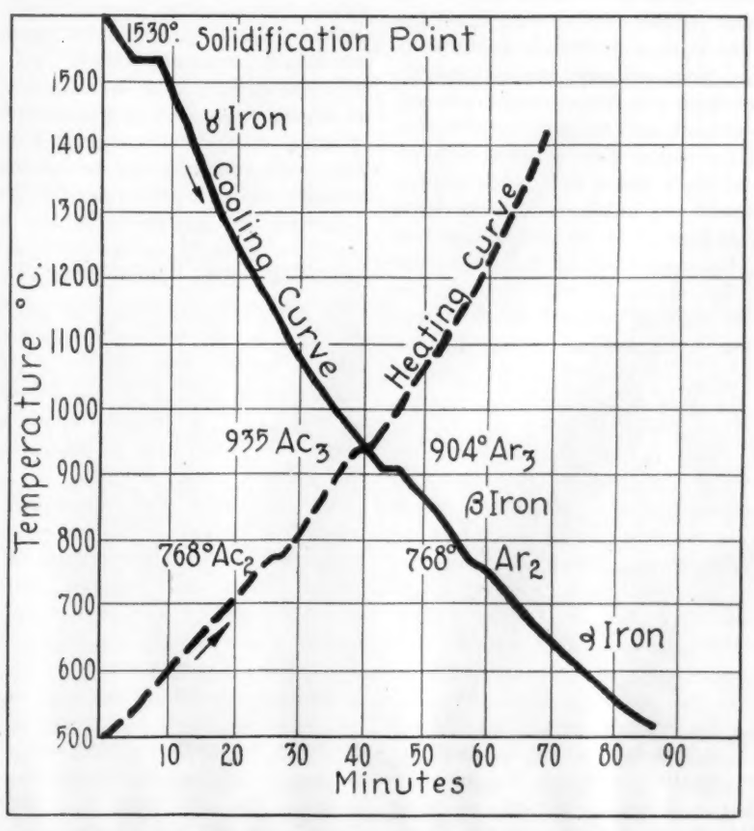


FIG. 3—COOLING AND HEATING CURVES OF PURE IRON

a shorter time by holding the metal in the recrystallization range for a certain time and then slowly raising the temperature to near the melting point.

The rules stated above apply to pure metals, or alloys of metals soluble in each other in the solid state (solid solutions) or alloys consisting chiefly of a pure metal or a solid solution. When a metal is polymorphic or allotropic, or consists of a number of different constituents, other factors come in to modify the structure and for this reason the structure of the iron-carbon series of alloys is discussed in detail. Details on the control of grain size in steel are given in Chapter III.

Structure of Iron-Carbon Series

Practically all of the irons and steels of commerce belong to the iron-carbon series of alloys and as the physical properties of this series are those of pure iron as modified by the addition of carbon it is necessary first to consider the properties of pure iron.

If a thermoelectric pyrometer is immersed in molten pure iron in a furnace and a record of the temperatures at given time intervals taken and these results are plotted on coordinate paper, a cooling curve such as shown in Fig. 3 is obtained. If the iron cooled from the liquid to the solid state and then to room temperature without any internal evolution of heat the curve would be uniform without any breaks or jogs. But it will be noted that at 1530 degrees Cent. (2786 degrees Fahr.) there is a horizontal jog. This is due to evolution of heat from the solidifying iron which balances the heat lost from the metal by radiation and reduces the rate of cooling to practically zero, resulting in a horizontal jog in the curve. At the solidifying or freezing point the heat of solidification, crystallization, or fusion is given out by the metal. This is due to the liberation of energy involved in the profound rearrangement of molecules taking place in passing from the liquid to the solid state. Above the jog the iron is liquid, below it, it is solid. As the white-hot but solid plastic iron cools there is no further evolution of heat as is evident from the smoothness of the curve until a temperature of 904 degrees Cent. (1659 degrees Fahr.) is reached when another jog occurs, smaller than the first one, indicating a lesser evolution of heat energy. This again marks a rearrangement of the molecular structure so that the structure below this temperature is different than above it. There is a polymorphic or allotropic change in the metal as described previously in this chapter. The change takes place at the critical point or temperature 904 degrees Cent. (1659 degrees Fahr.) which is known as A_3. Above A_3 the iron is in the *Gamma* state and below it in the *Beta* state. The matter of interest in this fact is that the properties of the two states of iron are different and under certain circumstances—for instance, by the addition of carbon or of manganese, and rapid cooling or quenching—may be preserved at room temperature. This is the key to the heat treatment of steel and the reason for the possible variation of the properties of iron and steel. On further cooling of the iron below 904 degrees Cent. (Ar_3) the curve is smooth until a temperature of 768 degrees Cent. (1415 degrees Fahr.) is reached when another jog marks an internal rearrangement or allotropic or polymorphic change. This critical point is Ar_2 and marks the change from *Beta* to *Alpha* iron. This transformation again involves changes in properties among the most marked of which is the magnetic property. In passing from *Beta* to *Alpha* iron the iron becomes magnetic and vice versa in passing to *Alpha* from *Beta* iron, magnetism is lost. Probably there are other allotropic points below A_2 which are not discussed here as having no important bearing on heat treatment.

It is evident that a critical point at which there is a rearrangement of structure must influence grain size and that grain size may not be continuous through the critical points. This is discussed in Chapter III.

May Take Heating Record

In place of the record of the cooling of iron, the record of the heating may be taken. This results in a heating curve, as shown in the dotted line in Fig. 3. The critical points again occur, but now heat is absorbed at the critical point in place of being given out. Also the temperature at which the change occurs is somewhat higher. The true temperature of the critical point lies between that obtained on cooling and on heating. The reason that the change occurs at a somewhat different temperature is that of molecular inertia or lag. In cooling, for instance, when the mass of iron reaches the temperature when the change is due, or the equilibrium temperature, the time element involved in the change (for the change is not instantaneous) is sufficient for the metal to cool considerably below the true critical temperature, before the evolution of heat caused by the change can manifest itself as a pyrometer reading. The exact designation or nomenclature of the critical points is shown in Table V.

The difference in temperature between Ar_3 and Ac_3 and between Ac_2 and Ar_2 is known as the lag of hysteresis. However, the transformation at A_2 occurs at practically the same temperature on heating or cooling and hence there is no hysteresis here.

Structure of Iron Changed

Cooling iron which above Ar_3 contracts with falling temperature according to the law of cooling bodies, in passing through Ar_3 dilates or expands suddenly about 1-1000 of its length. Conversely when in heating it passes Ac_3 it contracts 1-1000 of its length. This is evidence of the marked structural change occurring at this point. When iron changes from the *Gamma* to the *Beta* condition a complete change of crystallization takes place so that grain growth may occur when it is heated from below to above 904 degrees Cent., or is cooled from above to below that temperature.

The critical points in solid iron are in general like any critical point which marks a change of state; for example, from liquid to solid, or liquid to vapor. The freezing or solidification point of water or of iron are critical points. The position of a critical point, that is, the temperature at which it occurs, is influenced by the addition of other substances. Water freezes to ice at 0 degrees Cent. (32 degrees Fahr.) but when common salt is added this freezing point is lowered progressively until when 23.6 per cent salt has been added the freezing point is lowered to —22 degrees Cent. In the same way the addition of 4.3 per cent of carbon to iron lowers the solidification temperature of the iron from 1530 degrees Cent. to 1130 degrees Cent. A further addition of carbon again raises the freezing point. In the same way the addition of the carbon lowers the position of the critical points A_3 and A_2. As heat treatment is directed toward obtaining the properties of the metal inherent in the several states of the metal the change in the position of the critical points is highly important. The addition of carbon or other substances changes the iron from a pure metal to an alloy and in place of one substance which may exist in several modifications there is now present an aggregate of substances which necessarily has different physical properties from the pure metal.

(To Be Continued)

Strip Requirements Are Exacting

Various Steps in the Process of Manufacturing the Hot and Cold Rolled Product Necessitate Careful Manipulation—Causes of and Remedies for Many Defects Are Presented—Important Factors Are Discussed

BY R. H. INGRAHAM

METALLURGISTS have devoted much time to the development of tool and other high-grade steels, but only within recent years has any effort been made to iron out the defects which frequently arise in the manufacture of strip steel. As long as this commodity was used for flat or bent work only, there was no need of investigation but since the advent of draw presses and the adaption of strip steel to various uses, the producer has been obliged to acquire a thorough knowledge of the physical properties demanded by consumers. No attempt is made in this article to describe in detail the various stages in the manufacture of strip steel; rather the aim is to present the most important steps for the benefit of the many employes engaged in the business who know little about the process of manufacture outside of their own particular duties.

Raw material for the strip mill consists of either slabs or billets, cut to the required length, the size being determined beforehand. Many different widths and lengths of strip steel may be rolled from the same size billet, but comparatively few sizes from the same size slab. Defects cannot be rolled out of a billet or a slab, even if the strip is cold-rolled. The defect may not be visible to the naked eye, but nevertheless it will show up if the proper test is made. All defects are not serious. They may cause rejection of the steel when it is to be used for stamping, or deep drawing but the product may be applied on requirements which are not so exacting.

Temperature Is Important Factor

Care should be exercised in heating and rolling the semifinished material. An overheated ingot that is finished too hot will have a coarse grain, but this defect may be overcome in the strip mill by proper heating and rolling, unless it was burned in the soaking pit. Prime quality strip steel cannot be produced from an ingot or billet that has been burned. Usually one or both of the edges of the strip will be cracked. The surface may appear good, but a fracture test will show a coarse woody structure. It may have a sufficiently high tensile strength, but little ductility. Cracks will develop in the billet rolled from an ingot that apparently is hot enough on the outside, but too cold on the inside. This is a common defect, and can be overcome by increasing the heating capacity or at a sacrifice of tonnage by allowing the ingot to remain longer in the soaking pit.

Ingot Must Be Sound

Blow holes or gas pockets in an ingot are the cause of many rejections. The walls of the blow holes are oxidized and will not weld in the rolling operation. This defect is not easily detected in the finished strip, but will develop in the drawing operation. When a blow hole is ruptured in drawing, the rupture has the appearance of lamination, and is called laminated steel. Whenever blow holes near the surface of the ingot are broken in the rolling operation, the resultant billet or slab will have a scabby appearance. These scabs as well as all cracks, seams, or other visible defects, should be removed either by chipping or grinding, before further rolling is attempted. It is necessary to get to the bottom of the defect; otherwise the steel will be rejected in the cold mill or by the customer.

Defective steel, known to cold rollers as "shells" or "shelly steel" has caused much trouble and many rejections. It is almost impossible to detect shells in the hot-rolled strip. Their appearance is first noted during the cold-rolling operation. The shells may be close together or widely separated, and vary considerably in size. The cause of shells has not been determined to the satisfaction of strip steel makers. Inasmuch as the shells usually are accompanied by alumina inclusions, or inclusions of some nonferrous substance and appear to be oxidized on the underside, it is safe to assume that this condition existed close to the skin of the orginal ingot, probably in the form of small slag-filled pockets.

The billet yard should be divided into sections or bays and different sizes of billets and slabs of different qualities of steel should be piled separately so that they will be accessible. To avoid any chance of error a sufficient unmber of distinguishing marks should be placed on each pile. A card record should be kept of each heat of billets, and where two or more sizes have been rolled from the same heat the card should be made for each size. The information contained on the card should include the date of arrival, car number, heat number, number of pieces, weight, size, quality, identification marks, and location. The tonnage withdrawn should be deducted and the card kept on file until the entire heat has been used on the mill. The mill recorder should keep in close touch with the foreman of the billet yard, and he should order steel as needed by the mill. The billet yard foreman should be responsible for all steel delivered to the mill.

Probably the most important operation in working steel is the heating. A heater should know what changes are taking place in the steel, as it absorbs heat. He should be a good judge of temperatures, as few heating furnaces are equipped with pyrometers. The heater is required to know when the steel is in proper condition for rolling, and should know the critical points of steel of certain carbon content. Properly heated steel should be brought up slowly to the desired temperature, sufficiently above the upper-critical point, and allowed to remain at this temperature for a period of time necessary to heat the steel thoroughly and evenly, to a soft mellow heat. The visible changes to the steel that take place in the furnace are caused entirely by the heat applied to and absorbed by the steel.

Heating Forms Surface Scale

When the steel has become hot and has changed almost to a lemon color, its surface is covered with two layers of scale. The outer layer is much thicker than the underlayer, and is brittle. The outer layer of scale will crack and fall off, when the steel is drawn or discharged from the furnace. Scale is formed on the surface of steel during the heating operation by oxidization. Steel heated too rapidly will have a heavier coating of scale than if it were heated more slowly. Sudden changes in furnace temperature also have a tendency to increase scale and are likely to occur when an accident happens to the mill which necessitates holding the steel in the furnace for a long period of time.

To prevent the steel from becoming too hot, the heater must check the furnace or shut off the fuel supply, thereby

reducing the temperature. The steel now will radiate heat and become cooler, instead of absorbing more heat and becoming too hot. However, if the steel has become too hot, the furnace should not be checked too suddenly, or the steel will chill or freeze and stick together. When the temperature of the furnace is increased, and the steel is again ready for rolling, the layers of scale become thicker than before.

Steel Becomes Nonmagnetic

The invisible changes that take place in the steel are of more importance than those which can be seen. As an illustration suppose a furnace is charged with steel billets having a carbon content of 0.20 per cent. Each billet is charged in the rear end of the furnace in a cold state and becomes hotter and hotter with little change in appearance until it is about halfway through the furnace. Here it changes to a reddish color, its temperature being about 1000 degrees Fahr. The farther the steel advances into the furnace, the hotter it becomes. At the same time, the color becomes brighter. It is now almost cherry red, and the temperature is 1330 degrees Fahr. This is known as the first decalescent point, or the lower critical point. At this point, the steel becomes nonmagnetic, and instead of expanding at the normal rate, it contracts slightly for a few seconds and appears to absorb no heat.

It is reasonable to assume that the steel absorbs heat at the same rate at this temperature as at any other temperature, but some reaction taking place in the steel utilizes the heat so absorbed for some purpose, other than increasing temperature. This same phenomenon may be observed when the temperature of this particular steel reaches 1600 degrees Fahr. This is known as the second decalescent point, or the upper critical point. The reverse effect takes place upon cooling, except that the temperature will be about 3 per cent lower, and the steel regains its magnetism at the lower critical point. The time required to heat steel to a point where it is suitable for rolling depends upon the size of the slab or billet. Thoroughly heated steel must be soaked to a temperature well above the upper critical point When it reaches the upper critical point, it is said to be in the austenitic state.

Rolling should begin at a temperature several hundred degrees above the upper critical point and continued down just to that point. In other words, the draft of the rolls and speed of the mill should be so adjusted and regulated that the bar or strip will be in the finishing rolls when the temperature of the steel is at the upper critical point for 0.20 per cent carbon steel. The reason for this is obvious. When the structure of the steel is in the austenitic state, it is ductile and soft; the grain of the steel is broken up and refined by the mechanical action of the rolls, and the refined structure is preserved in the finished product.

When steel is finished too cold, mechanical strains or stresses are set up. This condition however, may be relieved by annealing. Steel which has been overheated and finished at too high a temperature, will have a coarse grain. Steel which has been burned in the furnace is absolutely worthless for stamping or drawing; it is brittle, both hot and cold, and a fracture will show a coarse, woody structure. This condition cannot be remedied by any known method of working nor by heat treating.

The primary reason for rolling steel was to reduce it to the desired size but later it was discovered that the mechanical action of the rolls has a refining influence on the structure or grain of steel. The main factors in successfully rolling strip steel from sound billets include correct rolling temperatures and proper amount of reduction in each set of rolls. Heavy gages should be rolled at a much lower speed than light gages; otherwise the strip will be finished too hot, and may be scaly and have a rough surface. The finished strip should be smooth and have no free scale.

When the surface of the roll becomes rough and cracks develop, the bar being rolled will show sharp projections on the surface. These high spots may become chilled by the water on the rolls, and will be flattened down and elongated with each succeeding pass. This condition seldom arises before the fifth or sixth set of flat rolls; the nearer to the finishing rolls however, the more trouble it will cause. Defects of this character are not easily nor quickly detected, but the practiced eye will invariably recognize the peculiar characteristics. A bending test will disclose it, or the defect will appear during the cold-rolling operation in the form of a sliver.

How Thin Edges Are Avoided

Thin edges are caused by rolling too long on the same section of the roll. When this condition appears, it is time to move over on to a new bearing or change rolls, as necessity requires. When one edge only is thin, the trouble is caused by the strip working off the bearing. The guides are set too far apart, and should be closed in. Entrance guides should be set as close as practicable. While a wide hole facilitates easy entrance, it also allows the bar to work back and forth on the bearing, and has a tendency to camber the bar, first one way and then the other, causing what is termed snaky steel.

When making light gage material, the finishing set of rolls should not be allowed to run empty for any length of time, especially when the top roll operates by friction, as there is danger of the next bar sticking causing the top roll to stop. The result will be a burned spot on the roll. This necessitates moving over on to a new bearing or changing rolls, as the burned spot will mark the strip at every revolution of the rolls.

Make Many Improvements

All strip steel is either cut to a specified length on the mill or is coiled in long lengths. Cut material must be close to the length specified, and the ends must be cut clean and square. Most coiled material is coiled hot, but amy be coiled cold, providing the gage is not too heavy. Many improvements have been made in the heating and rolling departments, with the object of increasing production. Continuous heating furnaces have been in use for many years. Continuous roughing mills have been installed. Motor driven roller tables have been placed between the various stands of rolls and other mechanical devices, designed to return the material to the rolls with greater speed than is possible by hand. Comparatively few improvements have been made to facilitate handling and shearing material after it is rolled. Producers are eager for a continuous automatic cutting machine that will cut any width and gage accurately to the desired length, and so designed that adjustments may be made quickly and easily.

All strip steel is pickled in a solution of sulphuric acid before cold rolling, the object of which is to remove the scale from the surface of the steel. Care must be exercised in this operation to insure the removal of all scale and to prevent over-pickling or burning the steel. When plain hot-rolled finished strip is pickled, it usually is oiled, limed or soaped afterward to retard corrosion or rust. Strips with heavy scale rolled into their surface will be pitted badly after pickling and therefore it is necessary to remove as much scale as possible, either before or during the rolling operation.

Steel should be washed thoroughly after it is taken from the pickling solution in order to remove all traces of acid; otherwise the acid will continue its corrosive action unless the steel is limed. In the latter case, the lime has a neutralizing effect on the acid. All strip steel, no matter whether it is pickled and oiled, pickled and limed, or plain hot rolled, should be kept free from dirt. Dirt and gritty substances

particularly are objectionable on oiled steel. They not only spoil the appearance of the steel, but may cause trouble to the customers' dies.

All strip steel is not annealed. It is not necessary to subject plain hot rolled finished strip steel to this process providing the heating and rolling operations have been performed at the correct temperature and that the steel has not been allowed to cool too rapidly. The object of annealing strip steel is to reduce its structure to a soft and ductile condition. The type of annealing furnace is unimportant. Correct temperatures and proper cooling methods are the factors controlling the annealing operation. Strip steel is usually annealed in cast-iron or cast-steel boxes. These boxes are made in two parts, consisting of a bottom, upon which the steel is packed closely; and a top, or cover, which is placed over the steel. The cover fits the bottom closely in order to exclude all oxygen during the annealing and cooling process. It may be necessary to seal the boxes with clay or sand, particularly when they have become warped.

Use of Pyrometers Avoids Errors

All annealing furnaces should be equipped with recording pyrometers, thereby avoiding chance of error. The chart will furnish a permanent record of the treatment which the steel received in the annealing furnace. The foreman of the annealing department should be familiar with the critical points of steel of any carbon content in order that he may apply intelligently the proper heat treatment. A greater degree of care must be exercised in annealing cold-rolled steel than plain hot-rolled material. The bright surface of cold-rolled strip steel must be preserved. Any discoloration caused by poor annealing may be the cause of rejection. Strip steel may be decarbonized in the annealing furnace. This is especially true of heavy gage material that was not pickled previous to annealing. This condition is more likely to arise in the presence of a heavily scaled surface. Decarbonization is probably caused by too rapid increase in temperature, and annealing at an excessively high temperature.

The cold-rolling operation imparts a highly polished finish to the surface of strip. In addition, the structure of cold-rolled steel is more dense and compact than that of the hot-rolled product. Low-carbon strip steel can be reduced on the cold mill as much as 60 per cent without preliminary annealing. This reduction is not accomplished by passing the strip through one set of rolls only, but by successive passes through several sets of rolls. The amount of reduction is governed by the size of the strip, and the quality of the steel. It is sometimes necessary to give the steel an intermediate annealing before being able to reduce it to the desired thickness, this being the case when light gages are required.

Cold-rolled strip steel may be produced to any desired temper, from full hard finish to dead soft. In the latter case, the strips are annealed as a final operation. Intermediate tempers are determined by the amount of reduction after annealing. Strips intended for plating must be smooth and free from surface imperfections. When the strips are ready for the finishing pass, the surface should not be allowed to touch the floor, as there is danger of the strip being scratched or some foreign matter may adhere to it and spoil the finish. Even a hair going through the rolls will leave an imprint and each succeeding revolution of the rolls will mark the surface of the strip being rolled. While this is not a serious defect, it shows the necessity of keeping the steel as clean as possible.

Chatter marks on the surface of the strip, which are caused by vibration, are a source of annoyance and may lead to rejection of the product. At some plants vibration is overcome to a certain extent by driving through herringbone gears. All strips are inspected carefully during the cold-rolling operation, and also after the strip is finished. Frequent tests are made to determine the physical properties of the steel. Seams and cracks may not be detected in the finished strip but these will appear in the drawing operation.

Steel may fail in the drawing operation, where no defect existed in the original strip. This failure usually is caused by improper annealing between drawing operations, or too great a draw in one operation. Scratches caused by the dies during the drawing operation may develop into cracks in a subsequent drawing, or may crack when subjected to heat treatment. Therefore, the necessity for determining the physical qualities of the steel before shipment to the customer. All cold-rolled strip steel is either cut to the length specified by customers or is coiled in long lengths. When an even width and parallel edges are required, the edges are trimmed off in a slitting machine.

Finished strips are oiled to prevent corrosion or rust and are boxed, bundled and burlapped, or shipped loose, as the customers specify. The shipper should see that cars are clean before any maerial is loaded. After loading, the strip steel should be carefully braced to prevent shifting of the load while in transit.

The foreman should explain to the employe the reason for each operation. An employe who lacks interest in his work is inefficient. The degree of interest and the desire to learn is the measure of his succes. It is the duty of the superintendent and the foreman in charge to supply the information he desires. Teach him his job, and the reason for doing it, and he doubtlessly will display more interest in his work as time goes on.

Efficient Methods for Burning Liquid Fuel

(*Concluded from Page* 1098)

handle with this method because the congealed oil in the pipe lines must be forced through the burners in starting. Dirt and sediment have a great tendency to collect in the pipe lines, due to the small flow. Pressure on the fuel tank is a decided fire hazard.

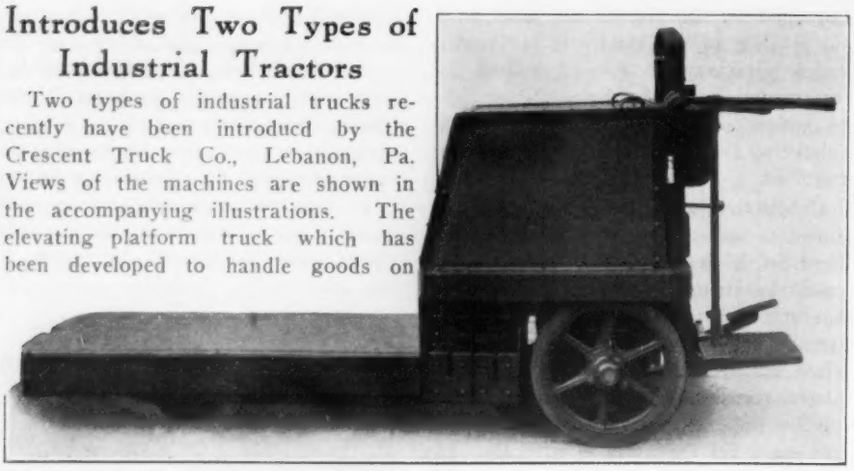
The gravity system is used in many small plants where only a few pieces of oil burning equipment are used. This system does not work satisfactorily with the heavier fuel oil due to the resistance in the pipe lines, and otherwise has about the same advantages as are found in the pressure system.

The standpipe system with an overflow is similar to the ordinary gravity system. The fuel is pumped to the standpipe and maintained at a constant level by an overflow opening. The fuel is fed to the various furnaces from the oil in lower portion of the standpipe.

Liquid fuels are best handled by the circulating system in which a rotary or reciprocating pump circulates the fuel through a pipe past the oil burning equipment and back to the tank through a relief valve. This valve can be set to maintain any desired pressure in the circulating system. Branch lines to each burner are tapped in on the main circulating pipe. Automatic shut-off valves can be installed on each branch line for protection. The moment the oil pump is started with this system the congealed oil in the main pipe is returned to the tank. The circulation of the oil has a great tendency to reduce the viscosity of the oil and to mix it thoroughly. The starting of an oil burner merely reduces the amount of oil returned to the tank. The flow is free from pulsations when the system is equipped with a rotary pump. If a reciprocating pump is used, an air chamber should be used to reduce the pulsations in the system to a minimum.

Introduces Two Types of Industrial Tractors

Two types of industrial trucks recently have been introducd by the Crescent Truck Co., Lebanon, Pa. Views of the machines are shown in the accompanyiug illustrations. The elevating platform truck which has been developed to handle goods on



ELEVATING PLATFORM TRUCK HAVING A LIFTING CAPACITY OF 4000 POUNDS

portable skids, has a capacity of 4000 pounds and travels at a speed of 4½ to 5 miles per hour. The power is obtained through a 24-volt, 35-ampere motor running at 1500 revolutions per minute. The controller is of the drum-type with three speeds forward and reverse. The drive is accomplished through two wheels but all four wheels are used in steering. The elevating mechanism is driven through a separate motor requiring 24 volts, 35 amperes and running at 1900 revolutions per minute. The lifting mechanism is totally enclosed, has chrome-nickel steel reduction gears, a hardened and ground jack screw, ball thrust and radial bearings, solenoid brake and drum-type control switch on the dash. The truck platform is constructed so that it can be raised 4½ inches.

The other type of truck is designed for use in pulling loads carried on trailers. This truck has a 2-wheel drive, 2-wheel steer with a normal draw-bar pull of 600 pounds and an ultimate draw-bar pull of 2400 pounds. Traveling light the truck will move at a speed of from 7 to 8 miles per hour and while loaded the speed is from 5 to 6 miles per hour. The machine is driven by a 48 volt, 45-ampere motor running at a speed of 1500 revolutions per minute. The length of the wheel base is 42 inches. These tractors are equipped with safety devices.

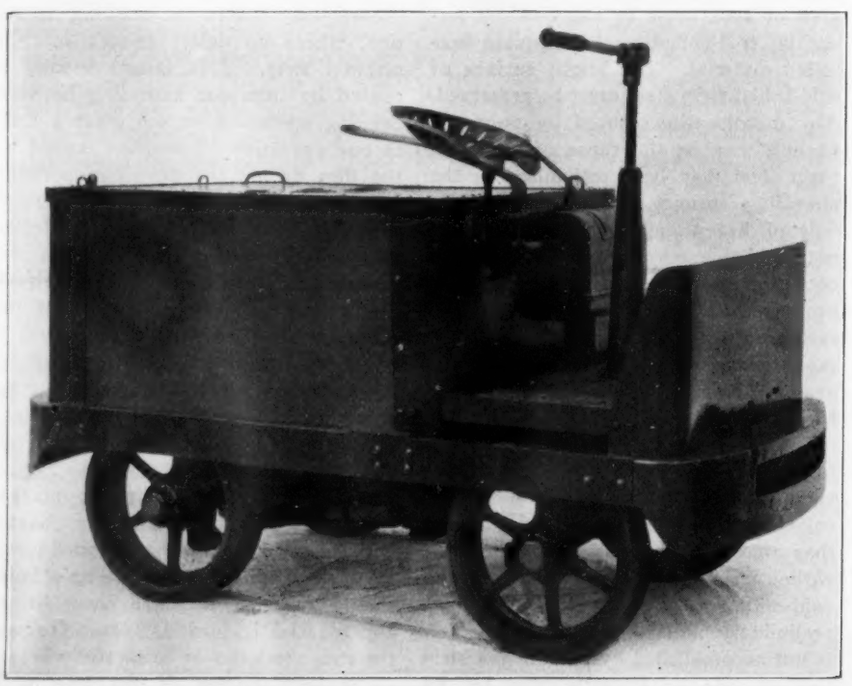
Graphite Industry Shows Little Improvement

General revival of industry after the depression of 1919 and 1920 has resulted in increased demand for graphite crucibles, foundry facings, lubricants, lead pencils and other manufactures of graphite. As a result of the world's production of graphite has risen from an estimated total of 87,167 metric tons in 1921 to an estimated total of 107,000 metric tons in 1922. Producers in Madagascar, Ceylon and Alabama and German, French, British and American dealers still hold large stocks of unsold graphite, however, and the market consequently is depressed. These stocks represent for the most part an overproduction of graphite in 1917 and 1918 and an accumulation of unsold output of 1919, 1920, and 1921, when the demand for graphite fell below normal.

Little graphite was mined in Canada during 1921 and none during 1922. Mexico shipped 3088 metric tons to the United States through Nogales, Ariz., in 1921 but only 1993 metric tons in 1922. No accurate statistics of German graphite production are available but the estimated output is 30,000 metric tons for 1922. In that year, as in the one previous, the depreciation of the German mark protected the Bavarian graphite producer from any serious competition from Ceylon or Madagascar sources. Germany is the principle graphite market for central Europe and her statistics of imports and exports of graphite and graphite products indicate an increased consumption. Increased rail rates handicapped Austrian producers but Czecho-Slovakian production increased considerably, sources being closer to the markets.

Ceylon exported a total of 11,023 metric tons in 1922, about 64.6 per cent of which went to the United States. Chosen shipped 1717 metric tons of flake graphite and 17,645 metric tons of amorphous graphite in 1922, 95 per cent of the total going to Japan. Madagascar on Jan. 1, 1922 held stocks officially estimated at 18,000 to 20,000 metric tons, practically the same as at the beginning of 1921, exports for the two years showing little change and being taken almost entirely from old stocks. Shipments to Great Britain consisted mostly of purchases of a single crucible manufacturer, while those going to France and Germany were made on consignment.

A voluntary petition in bankruptcy was filed in federal court recently by John Klumpp Jr., president of the Elwood Castings Co., Elwood, Ind., on behalf of the company. It was asserted that the board of directors had directed the action be brought when it was found the debts could not be met. Assets were set out as $20,934 and liabilities as $26,652.

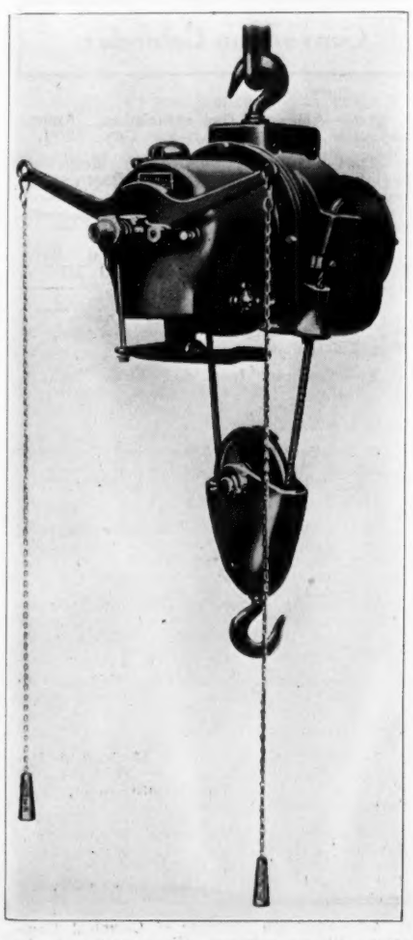


TRACTOR USED IN PULLING TRAINS OF TRAILERS IN THE FACTORY AND WAREHOUSE

Designs New Size Air Motor Hoist

For use in industries where rapid and economical lifting and handling of small tools which are too heavy for one man to move is desired, the Ingersoll-Rand Co., 11 Broadway, New York, recently has placed on the market a new style air motor hoist of exceptionally small and compact construction. The hoist is particularly adaptable to foundry work, machine shops of all kinds, boiler and structural shops, railroad shops and roundhouses. The new machine is shown in the accompanying illustration.

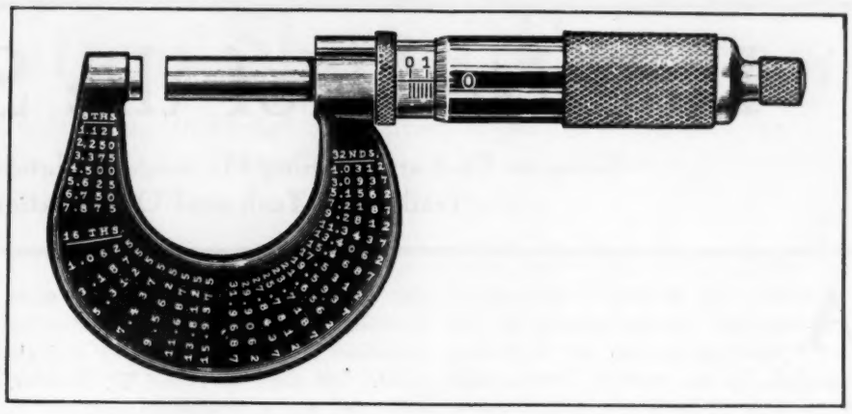
The features of the new hoist are the compactness of design resulting in low head room required, light weight, automatic brake that will hold the load under all circumstances, and a graduated throttle for regulating both lifting and lowering speeds. A balanced three-cylinder air motor is used which operates in either direction at any speed within the rated capacity. It is claimed that this motor is free from vibration and that it can be throttled down slowly on all loads. A safety stop lever is provided which closes the throttle and stops the motor whenever the load is by chance raised to the top of the hoist lift thus preventing damage from this source.



AIR MOTOR HOIST HAVING 500-POUND CAPACITY

The automatic brake holds the load at the desired position regardless of air pressure. The brake consists of a disk attached to the motor shaft and a brake plunger with friction face, which is held in contact with the disk by springs whenever the hoist is not operating. The lubrication of all parts has been thoroughly provided for, the motor and gears being both enclosed, the motor operating in a bath of oil and the gears in a heavy grease.

The capacity of the hoist is 500 pounds lifting 50 feet per minute under an air pressure of 80 pounds. The maximum lift is 15 feet. The hoist can be operated on pressures from 60 to 100 pounds. A roller bearing monorail trolley can be provided in place of the hook if desired.



DECIMAL EQUIVALENTS APPEAR ON FRAME OF MICROMETER

Show Decimal Equivalents on Micrometer Frame

Micrometers with the frame embodying decimal equivalents recently have been introduced by the Reed Small Tool Works, Worcester, Mass. In introducing this new feature, it has not been necessary to change the deep throated concave form of frame. The new micrometers in other respects are similar to those previously made by the company and are distinguished by the two part thimble with easy adjustment to compensate for wear on anvil and spindle surfaces, the stationary anvil with the narrow frame at the measuring point and the rigid threaded locked joint, making the thimble and spindle practically one piece.

The frame is forged from steel and heat treated for special finish. The decimal equivalent figures are raised in finishing dies subjected to about 500 tons pressure. The decimal equivalents of 8ths, 16ths and 32nds stand out permanently on the front of the frame while 64th equivalents appear on the reverse side. The micrometers can be supplied in the 1-inch size only. The device is shown in the accompanying illustration.

National Tube Plans Research Laboratory

Pittsburgh, Oct. 16.—The National Tube Co. plans to build a large research laboratory in the Schenley district here near the Mellen institute, the Carnegie Institute of Technology and other research laboratories. The plan is in its formative stages and its carrying out is contingent upon the United States government agreeing to transfer a triangular plot, containing about 1900 square feet adjoining the property whereon is located the United States bureau of mines, Forbes street, Pittsburgh. Director Foster Bain of the bureau in Washington stated that the land is not needed by the bureau and that he is seeking to obtain the consent of congress to the transfer. A bill is to be presented in the forthcoming session of congress to authorize the sale to the tube company.

In a letter to Mr. Kelly, F. N. Speller, metallurgical engineer of the National Tube Co., said:

"The purpose of this laboratory is to carry on chemical and physical research work for the double purpose of improving the material process and manufacture of steel tubes and pipe, and secondly to improve the service given by these products. This institution will have an educational value in teaching those interested how to get the best service out of tube products of which about 3,000,000 tons are produced annually in this country.

"By locating such a research laboratory near the bureau of mines and other organizations interested in technical research work there is a material advantage in having a large number of technically trained men associated together. Such association tends to keep up the standard of work and creates a co-operative spirit."

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

AMONG the features of the program for the regional meeting of the American Society of Mechanical Engineers, to be held in Chattanooga, Tenn. Oct. 23-24 is a technical session on welding scheduled for Tuesday morning, a power and fuel session Tuesday evening and a meeting devoted to management problems Wednesday morning. The complete program is as follows:

Tuesday, October 23

9:00 a. m. Opening of headquarters at Hotel Patten

10:00 a. m. Session on Welding. Chairman, Senator Newell Sanders. "Welding in Locomotive Repair Shops," by Fred E. Rogers; "Welding Pressure Vessels and Pipe Lines," by S. W. Miller; "Arc Welding," by R. D. Reed; Motion Pictures, "Oxygen the Wonder Worker."

1:30 p. m. Excursion to Hale bar steam power plant.

8:00 p. m. Session on Power and Fuel. Chairman, Senator Newell Sanders. Brief address by President John Lyle Harrington. "Power Development of the Southern Appalachian Slope," by J. A. Switzer and W. R. Woolrich; "Use of Pulverized Fuel as Applied to the Open Hearth Furnace in Small Plants," by R. H. Lowndes.

9:30 p. m. Smoker.

Wednesday, October 24

10:00 a. m. Session on Management, Chairman, Senator Newell Sanders. "Methods of Measuring Management," by J. W. Roe; "Computation of Ratios for the Measurement of Management," by D. W. Knowles. Discussion of principles governing location and size of industrial plant.

1:30 p. m. Excursion to Crane Co. (Enamelware Plant), Points of Scenic Interest.

The program has been arranged so that there will be opportunity to visit points of scenic interest as well as industrial plants. Among the inspection trips will be a visit to the steam plant at Hales Bar, where J. A. Longley, Tennessee Electric Power Co., will describe the development. An inspection of the Crane Co. plant will be made.

In arranging the session on welding the consideration of practical applications has been featured as being of greatest value to engineers who will attend the meeting. The session was arranged with the cooperation of the American Society of Mechanical Engineers machine shop practice division.

The session on management, arranged with the co-operation of the management division, is one of the meetings to be held throughout the country in observance of management week. The paper by Joseph W. Roe, professor of industrial engineering, New York university, is to be the key paper for many of the meetings. It furnishes a basis for comparing managerial performance in different plants of the same or allied industries, but more particularly it offers a means of following variations in the management of a single plant. The paper by Daniel W. Knowles, industrial engineer, Chicago, will be in the nature of a discussion of Prof. Roe's paper. The topic "Principles Governing Location and Size of Industrial Plants," will be discussed from the floor.

* * *

To Meet in London

The next meeting of the British Institute of Metals will be held in London, March 12 and 13, 1924, with the annual dinner on March 12. Arrangements also have been made for from six to eight papers to be presented during the winter at each of the six local sections of the institute.

* * *

Plan Management Week

Over a score of meetings for spreading the ideals of better management will be held in different parts of the United States during the week of Oct. 22, or near that time. Programs for these have been arranged under the direction of representatives of the American Society of Mechanical Engineers, the Taylor society, the Society of Industrial Engineers, the American Management association, and the National Association of Cost Accountants, who are co-operating in this second observance of Management week, which was instituted by the American Society of Mechanical Engineers in 1922.

* * *

Announce Election Results

As a result of the recent election of the American Society of Mechanical Engineers, the following officers have been chosen: President, Fred R. Low, New York; vice presidents, H. Birchard Taylor, Philadelphia; George I. Rockwood, Worcester, Mass.; W. J. Sando, Milwaukee; managers, E. O. Eastwood, Seattle; E. R. Fish, St. Louis; F. A. Scott, Cleveland; treasurer, William H. Wiley; delegates to American Engineering council, F. K. Copeland, Chicago; J. T. Faig, Cincinnati, R. E. Flanders, Springfield, Vt.; Dexter S. Kimball, Ithaca, N. Y.; W. B. Powell, Buffalo; William Schwanhausser, New York; S. W. Stratton, Cambridge, Mass.; C. C. Thomas, Los Angeles; P. F. Walker, Lawrence, Kan.

* * *

To Feature Hydroelectric Power

The leading session of the annual meeting of the American Society of Mechanical Engineers, to be held in New York Dec. 3-6, inclusive, will deal with the "Principles Underlying the Development of Hydroelectric Power." It will be a joint session with the American Society of Civil Engineers and the American Institute of Electrical Engineers. The National Exposition of Power and Mechanical Engineering will be held at the Grand Central palace during the same week.

Convention Calendar

Oct. 15-20—American Gas association. Annual convention, steel pier, Atlantic City, N. J.

Oct. 23-24—American Society of Mechanical Engineers. Regional meeting, Chattanooga, Tenn. E. C. Patterson, general manager, Chattanooga Boiler & Tank Co., Chattanooga, Tenn., is in charge of details.

Oct. 24-26—National Association of Farm Equipment Manufacturers. Annual Meeting at Cleveland.

Oct. 24-26—American Welding society. Fall meeting at Pittsburgh. M. M. Kelley, 33 West Thirty-ninth street, New York.

Oct. 25—American Iron and Steel institute. Fall meeting, Hotel Commodore, New York. E. A. S. Clarke, 40 Rector street, New York, is secretary.

Oct. 25-26—Society of Automotive Engineers. Production meeting, Cleveland. Coker F. Clarkson, 29 West Thirty-ninth street, New York, is general manager.

Oct. 25-27—American Gear Manufacturers association. Fall meeting, Mountain house, Lake Mohonk, N. Y. T. W. Owen, 2443 Prospect avenue, Cleveland, is secretary.

Oct. 29—Nov. 1—American Management association. Annual convention. Hotel Astor, New York. W. J. Donald, 20 Vesey street, is managing director.

Nov. 19-22—Electric Power club. Fall meeting at French Lick Springs hotel, French Lick, Ind. S. N. Clarkson, Rockefeller building, Cleveland, is secretary.

Dec. 3-6—American Society of Mechanical Engineers. Annual meeting, New York. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

Dec. 3-8—Power and Mechanical Engineering— National Exposition, Grand Central palace, New York. Fred W. Payne and Charles F. Roth, Grand Central palace, New York, are in charge.

Dec. 5-8—American Institute of Chemical Engineers. Winter meeting, Washington. J. C. Olsen, Polytechnic institute, Brooklyn, N. Y., is secretary.

Steel Exhibition Shows Progress

Range of Equipment and Products at Pittsburgh Exposition of American Society for Steel Treating Wider Than Last Year—Number of Machine Tools Attracts Attention—Many Furnaces in Operation

PERHAPS the outstanding feature of the 1923 exposition conducted in conjunction with the Pittsburgh convention of the American Society for Steel Treating, Oct. 8-12, was the wider range of equipment and products on display. The exposition was held at Motor Square Garden. The field of furnaces, apparatus and material for use in the heat treatment of metals was well represented. Finished products covered a wider range than ever before and included practically everything from heavy forgings and castings to ball bearings.

Numerous electric furnaces were shown in operation. The Westinghouse Electric & Mfg. Co., East Pittsburgh, showed a small muffle type heat treating furnace with temperature control apparatus, also melting pots and laboratory temperature furnaces. A 5-kilowatt air drawing furnace, a 13-kilowatt box type furnace, and a 7.5-kilowatt semicylindrical furnace were operated by the General Electric Co., Schenectady, N. Y. An electric furnace with temperature control together with oil burners was exhibited by the George J. Hagan Co., Pittsburgh. Two small electric melting furnaces operating on either alternating or direct-current, 110-volts were operated by Holcroft & Co., Detroit, while Hoskins Mfg. Co., Detroit, operated a continuous electric heat treating furnace in which the work consisting of small parts is pushed through five refractory tubes. Control apparatus also was shown. A small electric hardening furnace with an automatic control unit was operated by Tate-Jones & Co., Pittsburgh. W. S. Rockwell & Co., New York, exhibited a model of a continuous rotating heat treating furnace as well as oil and gas burners.

Two gas-fired tool heating furnaces, one with a recuperator, together with automatic control, a soft metal furnace and furnace models composed the equipment of the Combustion Utilities Corp., New York. A new type of oil and gas burner automatic control and high temperature electric furnace resistors were displayed by the F. J. Ryan & Co., Philadelphia. Bellevue Industrial Furnace Co., Detroit, operated a vertical complete muffle, high speed steel furnace with temperature control, also a tilting aluminum furnace. A new gas-fired high speed steel furnace with gas preheating chamber, oil and gas burners, and apparatus for controlling stoker feed, fan speed and damper made up the display of the Dempsey Furnace Co., Jersey City, N. J. The Chicago Flexible Shaft Co., Chicago, operated a tool hardening furnace and a 2-pot gas-fired furnace using liquid heating media. An oil-fired, over-fired heating furnace, a smoke model furnace, two calorizers and a blower composed the exhibit of the Mahr Mfg. Co., Minneapolis.

Oil burners, low pressure oil burners, gasoline and kerosene torches, portable furnaces and high pressure oil tanks were shown by the Hauck Mfg. Co., Brooklyn, N. Y., while gas and oil burners and gas carburetors were exhibited by the Surface Combustion Co., New York. N. C. Davison Gas Burner & Welding Co., Pittsburgh, demonstrated combination oil and gas burners of high and low pressure types and S. Severance Mfg. Co., Glassport, Pa., showed oil burners, rivet sets, punches and dies.

Air Reduction Sales Co., New York, demonstrated oxyacetylene cutting and welding, and exhibited all types of accessories used in this work. Welding and cutting apparatus for oxyacetylene and specimens of steels cut and welded were shown by the Linde Air Products Co., New York. A flash-proof electric

ONE OF THE MOST ATTRACTIVE EXHIBITS AT MOTOR SQUARE GARDEN WAS THAT OF THE VULCAN CRUCIBLE STEEL CO., ALIQUIPPA, PA., SHOWING MANY USES OF TOOL STEEL

TYPICAL EXHIBITS AT THE INTERNATIONAL STEEL EXHIBITION AT MOTOR SQUARE GARDEN, PITTSBURGH

The illustration at the upper left is of the booth of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. At the upper right are shown a variety of castings exhibited by the Ohio Steel Foundry Co., Lima, O. The many uses of vanadium steel were demonstrated in the attractive exhibit of the Vanadium Alloy Steel Co., Pittsburgh, pictured at the lower left of this page. Oxyacetylene welding and cutting apparatus dominated the exhibit of the Air Reduction Sales Co., New York

butt welder with capacity up to 1½-inches round, a spot welder and specimens of welds were displayed by the Federal Machine & Welder Co., Warren, O., while the American Car & Foundry Co., New York, operated two and three-electrode heaters and a 4-foot heater for heating rods and rivets.

An air compressor driven directly by a synchronous motor and providing air pressure for operating sand blast equipment of another exhibitor was operated by the Pennsylvania Pump & Compressor Co., Easton, Pa. Two small turbo-compressors in the booth and a larger one for supplying air to the numerous operating gas furnaces made up the equipment shown by the Spencer Turbine Co., Hartford, Conn.

Among the exhibitors showing pyrometers, temperature control and recording apparatus were Leeds & Northrup Co., Philadelphia; Taylor Instrument Co.'s, Rochester, N. Y., Charles Engelhard, Inc., New York; Bacharach Industrial Instrument Co., Pittsburgh; Bristol Co., Waterbury, Conn.; Wilson-Maeulen Co., New York; and Brown Instrument Co., Philadelphia. Bausch & Lomb Optical Co., Rochester, N. Y., and E. Leitz Inc., New York, each showed complete equipment for metallographic study and the preparation of specimens.

In addition to showing photomicrographic apparatus, the Scientific Materials Co., Pittsburgh, showed pyrometers and a Brinell tester. The Pittsburgh Instrument & Machine Co., Pittsburgh, showed Brinell testing and impact testing apparatus; the Steel City Testing Laboratories, Pittsburgh, showed hydraulic Brinell machines; and the Shore Instrument & Mfg. Co., Jamaica, N. Y., exhibited scleroscopes, optical temperature indicators and carburizing and hardening compounds. Tinius Olsen Testing Machine Co., Philadelphia, had at its booth testing machines for making tensile, compression, transverse, ductility and Brinell tests. In addition several other machines were shown.

Uses of Steel Shown

An unusually good idea of the wide diversity of uses of high grade iron and steel was afforded by the exhibits of steel producing companies. Specimens of various materials which enter coke ovens, blast furnaces and open hearths together with the amount required and the yield in each case were displayed as an educational feature of the exhibit of the Bethlehem Steel Co., Bethlehem, Pa.

That the application of stainless and rustless steel is growing rapidly was shown by the large display of products manufactured from this grade of steel. Articles ranging from golf clubs to harness fittings were to be found in the exhibits of the American Stainless Steel Co., Pittsburgh; Firth-Sterling Steel Co., McKeesport, Pa.; and the Ludlum Steel Co., Watervliet, N. Y. Tool and alloy steel products both in the semi-finished and finished state were displayed by Vanadium-Alloys Steel Co., Latrobe, Pa.; United Alloy Steel Corp., Canton, O.; Vulcan Crucible Steel Co., Aliquippa, Pa.; Pittsburgh Crucible Steel Co., Pittsburgh; Crucible Steel Co. of America, New York; Atlas Steel Corp., Dunkirk, N. Y.; and the Halcomb Steel Co., Syracuse, N. Y.

Molybdenum and vanadium came in for their share of attention, being shown in ore and metallic form. Uses to which both elements are put in the iron and steel industry also were displayed in form of air hammers, drills, automobile springs, etc. Companies which participated in this line of display included the Vanadium Corp. of America, New York; Climax Molybdenum Co., New York; and the Molybdenum Corp. of America, Pittsburgh.

Tools used largely by the machine tool industry such as twist drills, punches, dies, reamers, rivet sets, etc., were prominently displayed by numerous producers such as the National Twist Drill & Tool Co., Detroit; Goddard & Goddard Co., Inc., Detroit; Cleveland Steel Tool Co., Cleveland; and the Haynes Stellite Co., New York. Chain forgings in the rough and finished state were dislayed by the Witherow Steel Co., Pittsburgh, while the United States Chain & Forging Co., Pittsburgh showed samples of heat treated chain and the comparative wear of automobile skid chains by continuous contact with brick.

An apparatus for testing uniform sphericity of steel balls, which was displayed by the Heppenstall Forge & Knife Co., Pittsburgh, attracted considerable attention. The steel balls leaving a short runway drop in turn upon a block of steel, rebound and pass through a ring supported about 4 feet above the floor level. The balls falling upon a second steel block set on an angle are deflected at right angles and pass unto a container about 4 feet above the floor level. Balls in any way defective as to sphericity fail to make the circuit. Dies, forgings, stampings and motion pictures also were exhibited by this company and by the Kinite Co., Milwaukee. Samples of various types of balls, a display case showing the various stages of production and how balls are graded to size by a machine were shown by the Hoover Steel Ball Co., Ann Arbor, Mich.

A huge nickel steel band saw blade, 42 feet long and 12 inches wide, which when operating travels at a speed of 2 miles a minute, was exhibited by Henry Disston & Sons, Inc., Philadelphia in addition to saws of other types. Metal cutting saws and saw machinery also were displayed by E. C. Atkins & Co., Indianapolis. The wide application of nickel in the steel industry was depicted by the International Nickel Co., New York, whose display included pneumatic hammers, tractor shoes and sprockets, turbine reduction gears, nickel shot, band saws, shovels and other commodities containing nickel too numerous to mention. A duplicate of the steel crankshaft used in the airplane which won the Pulitzer prize early this month when it traveled at 244 miles an hour, was displayed by this company. While the shaft weighs only 40 pounds it is designed to carry a load equivalent to 700 horsepower.

Carburizing Boxes Shown

Boxes, pots and retorts used for carburizing and annealing were on display at the booths of the General Alloys Co., Boston; the Swedish Crucible Steel Co., Detroit; and the Driver-Harris Co., Harrison, N. J. The exhibit of seamless steel tubes was confined to the Babcock & Wilcox Tube Co., Beaver Falls, Pa., and nickel tubing to Victor Hybinette, Wilmington, Del. Heat resisting commodities in the form of castings, bars, sheets and wire were shown by the Cutler Steel Co., Pittsburgh, and the Ohio Steel Foundry Co., Springfield, O. and specially hardened gears by R. D. Nuttall Co., Pittsburgh. The method of packing steel into crucibles together with several grades of die blocks were shown by the Colonial Steel Co., Pittsburgh, while trimmer steel, piston rods and rams were exhibited by the Union Electric Steel Corp., Carnegie, Pa.

Hardened and ground rolls for cold rolling tin plate and the eight stages of manufacturing revolver chambers attracted attention at the booth of the Midvale Co., Nicetown, Philadelphia. Enlarged photographs illuminated from the rear and showing various interior views of the company's works at Massillon, O. together with various finished parts formed from alloy steel were displayed by the Central Steel Co. The Interstate Iron & Steel Co., Chicago made use of a motion picture machine for showing the various steps entailed in the manufacture of alloy steel and had on display at its booth automobile crankshafts, springs, bumpers and gear parts made from steel of this grade. Nickel plated cross sections of the various products manufactured by the Jones & Laughlin Steel Corp., Pittsburgh, were exhibited.

Cleaning compounds and their appli-

cations were shown by the Skybryte Co., Cleveland; the J. B. Ford Co., Wyandotte, Mich.; and the Dearborn Chemical Co., Chicago. A washing machine, 11 feet long and weighing 2300 pounds, for removing oil, chips, grit, etc., from metals preparatory to enameling and finishing was exhibited by the Crescent Washing Machine Co., New Rochelle, N. Y. Refractory shapes used for furnace linings, insulating supports, etc., were on display at the booths of the Electrical Refractories Co., East Palestine, O.; Quigley Furnace Specialties Co., New York; and E. J. Lavino & Co., Pittsburgh. The latter company also showed samples of ferroalloys such as ferromanganese and ferrotungsten.

Compounds for use in the case and cyanide hardening processes, luting preparations and quenching and tempering oils were displayed by the Rodman Chemical Co., Verona, Pa.; the Case Hardening Service Co., Cleveland; E. F. Houghton & Co., Philadelphia; Park Chemical Co., Detroit; and the Roessler & Hasslacher Chemical Co., New York.

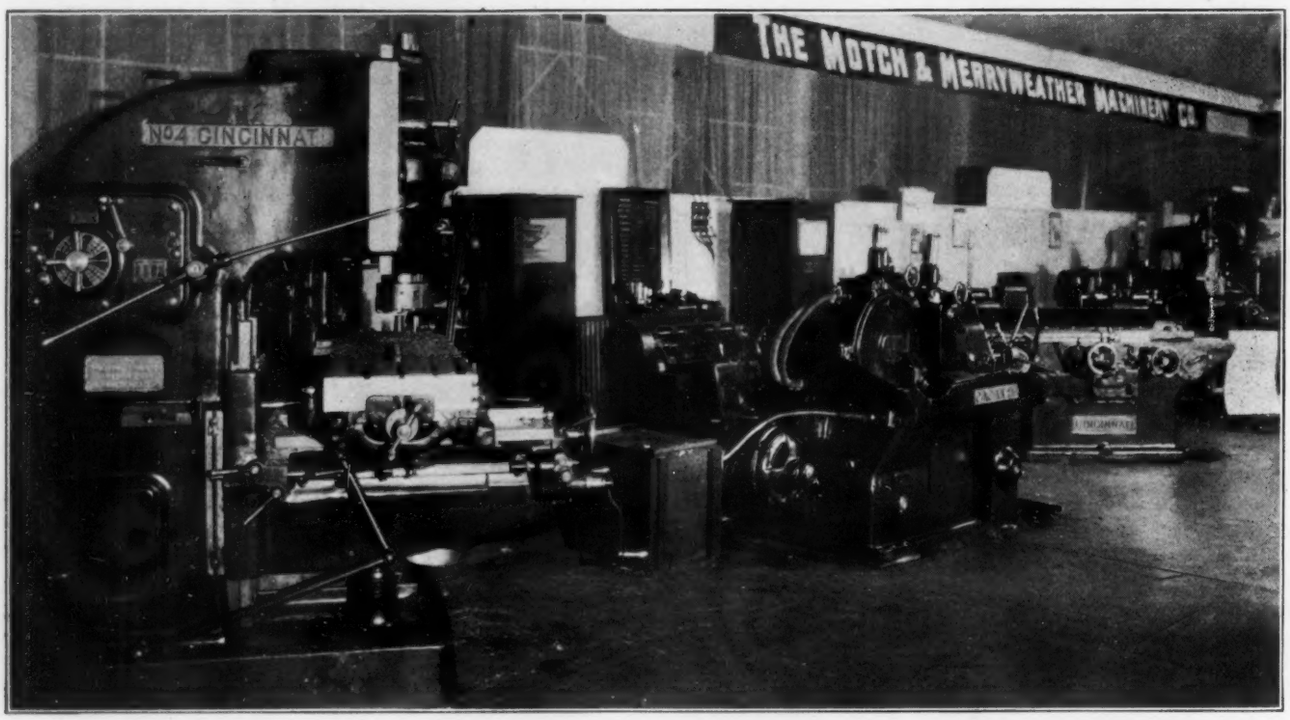
A heating medium for hardening and tempering of carbon, high-speed and alloy steels also was shown by the Bellis Heat Treating Co., New Haven, Conn. Numerous stamping devices, steel letters and figures, together with steel and embossing dies were displayed by James H. Mathews & Co., Pittsburgh. Similar products were on display at the booth of the Pannier Bros. Stamp Co., Pittsburgh, at which also was shown a duplicate of the first known mechanical means of making a mark.

Cement for high-temperature equipment was displayed by the King Refractories Co., Inc., New York; S. Obermayer Co., Pittsburgh; the Armstrong Cork & Insulation Co., Pittsburgh. The latter company together with the Celite Products Co., Chicago each showed heat insulating products. Exhibits of an educational character were found in the booths of the United States bureau of standards, Washington, and the Carnegie library, Pittsburgh, in the way of literature, photographs, standard chemical samples and other material which depicts the field of activities of both institutions.

The display of tractors, elevating platform trucks, trailers, etc., was confined to W. E. Hamilton and associates, Pittsburgh, and of drop hammer boards and pins to Charles Kleist & Son, Jamestown, N. Y. A new type metal window ventilator together with sanitary products were shown by the Champion Sales Co., Pittsburgh. Application of valves to the steel industry was displayed by the Homestead Valve Co., Homestead, Pa., while various steel commodities such as sheets, pipe, bolts, etc., that had been subjected to temperatures up to 1700 degrees Fahr. were exhibited by the Calorizing Co., Pittsburgh. Recuperators for furnaces also were shown.

Growth of interest on the part of machine tool builders in the steel treaters' exhibition is denoted by the fact that more machine tools for the working of steel were shown than ever before in the history of the exposition. Group displays in operation were featured by the Motch & Merryweather Machinery Co. and the Laughlin-Barney Machinery Co., Pittsburgh dealers. The former occupied practically the one entire side of Motor Square Garden and the display consisted of machines built by the following: American Tool Works Cincinnati, one each 3-foot radial drills and one each 12-inch lathe with relieving taper attachment, and 24-inch heavy duty lathe; Baker Bros., Toledo, O., 1½-inch maximum capacity light, heavy duty drilling and boring machine; Blanchard Machinery Co., Cambridge, Mass., vertical face grinding machine with direct motor drive and caliper attachment; Bullard Machine Tool Co., Bridgeport, Conn., vertical turret lathe; Cincinnati Grinder Co., Cincinnat', Motor-driven universal grinding machine with special duty head stock for die work; Cincinnati Milling Machine Co., Cincinnati, vertical and universal milling machines, cutter grinder, centerless grinder and universal grinder; Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., horizontal boring mill with motor drive; Gould & Eberhardt, Newark, N. J., 32-inch shaper with direct connected constant speed motor drive; Keller Mechanical Engineering Corp., Brooklyn, N. Y., automatic die sinking machine, cutter grinder, and flexible shaft bench grinder (the die machine was operated on actual die work, one job in particular being making a die for turbine blades from a

(*Concluded on Page* 1124)



THIS YEAR'S EXHIBITION WAS MARKED BY ONE OF THE MOST REPRESENTATIVE DISPLAYS OF MACHINE TOOLS HELD AT ANY SHOW IN RECENT YEARS. THE LARGEST EXHIBIT OF MACHINE TOOLS WAS THAT OF MOTCH & MERRYWEATHER MACHINERY CO., CLEVELAND

Steel Treaters Extend Activities

Proposed Constitutional Change Would Broaden Field of American Society for Steel Treating—Fifth Annual Convention and Exposition Held in Pittsburgh Establish New Attendance Records—Many Technical Papers Are Presented

WITHOUT reservation the fifth annual convention and exposition of the American Society for Steel Treating held in Pittsburgh last week, Oct. 8-12, may be judged the most outstanding yet conducted by that society. Registration reached a total of approximately 1800 of which 1492 were classified as members. Thus on the basis of a total society membership of 3000, the attendance represented almost 50 per cent, a figure probably never before reached by the larger technical organizations. The Monday sessions were reported in the Oct. 11 issue of IRON TRADE REVIEW.

Technical sessions in the morning were held at the William Penn hotel, while the afternoon meetings were conducted at Motor Square Garden, where the exposition was in progress. Attendance at these meetings was unusually large and may be attributed to the facts that no simultaneous meetings were held and the opening of the exposition was arranged so as to offer little interference to the operation of the program. Motor Square Garden is located six miles from down-town Pittsburgh, but in spite of this, the attendance there broke all previous show records, it being estimated that upwards of 40,000 people passed through during the five days. Two floors were devoted to the exhibits which represented a considerably wider range of equipment than last year. The total floor space was about one-third larger than in 1922, nevertheless it was necessary to refuse many applications.

The annual meeting of the society was held on Wednesday morning, T. D. Lynch, national president, presiding. The report of the tellers of election was read, the officers named in the accompanying box being elected. In his address as retiring president, Mr. Lynch stressed the growth and progress of the society during the past year, J. V. Emmons, metallurgist, Cleveland Twist Drill Co., Cleveland, and national treasurer, presented a most favorable report, reflecting the substantial growth of the society and the success of its expositions. Reporting for the office of national secretary, W. H. Eisenman announced an increase of 433 members during the year, bringing the total to 2746 on Sept. 1, a gain of 18.7 per cent. Considerable time was devoted to the discussion of a new tentative constitution and by-laws drawn up by the constitution and by-laws committee of which S. M. Havens, Ingalls-Shepard division, Wyman-Gordon Co., Harvey, Ill., is chairman. One of the most notable changes made in the new draft is in the statement of purpose of the society to read "The object of this society shall be to promote the arts and sciences connected with either the manufacture or treamtent of metals, or both." The words "either the manufacture or" do not appear in the present constitution and the word "metals" reads "iron and steel."

Entertainment feature included a smoker and entertainment in the ball room of the William Penn hotel on Tuesday evening, an informal dance at the same place on Wednesday evening and the banquet at the Fort Pitt hotel on Thursday evening. The ladies were entertained by numerous sight seeing trips, shopping excursions, luncheons, a trip through Carnegie institute and a theater party on Tuesday evening. Inspection trips were made to plants of the Westinghouse Electric & Mfg. Co., Carnegie Steel Co., National Tube Co. and other companies in the Pittsburgh district.

Invitations for the 1923 convention and exposition were received from the Cleveland, Boston, New York, Buffalo, Washington and Los Angeles chapters and from Atlantic City. No choice will be made, however, until the board of directors meets in Washington early in November.

Consider Hardening and Carburizing Problems

CARBURIZATION and case hardening were discussed at the Tuesday morning session at which A. H. d'Arcambal, metallurgist, Pratt & Whitney Co., Hartford, Conn. presided. In the first paper. "Measurement of Carbon Penetration in Carburized Steels" by S. P. Rockwell, consulting metallurgist, Hartford, Conn., and Frederick Downs, chemist, New Britain Machine Co., New Britain, Conn., Mr. Rockwell urged the adoption of a standard method for measurement of case hardness. A wide variation is shown by various methods and on various steels. Discussion showed that the common method in use is the fracture of specimens with an eye examination for depth of case. For more accurate determinations the miscroscope is used. An illustrated paper, "Case Hardening and Other Heat Treatments as Applied to Gray Cast Iron," by H. B. Knowlton, instructor, Central Continuation school, Milwaukee, reported that little work had been done on this subject. In one case where commercial work had been done satisfactorily, failure was met when the source of supply of the castings was changed. In the author's experiments it was found that the case of castings could be made harder although doubt existed as to whether it was a case hardening action, however, packing in a compound seemed to produce greater hardness. Briefly, the object was a malleablizing process with a case hardening effect all in one operation.

"Influence of Barium Carbonate upon Wood Charcoal Used for Cementation," a paper prepared by B. F. Shepherd, metallurgical department, Ingersoll-Rand Co., Phillipsburg, N. J., and presented by S. C. Spalding, Halcomb Steel Co., Syracuse, N. Y., proved that the depth of case is increased when barium carbonate is added to wood charcoal, the smaller amounts being more effective than larger. The mixtures of wood charcoal to barium carbonate were 60 to 40, 77.5 to 22.5, 95 to 5, 97.5 to 2.5, and 100 to 0 per cents, respectively. The mixtures containing the least barium carbonate were the most desirable to handle. Sam Tour, metallurgist, Doehler Die Castings Co., Brooklyn, N. Y., read a paper entitled "Salt Baths and Containers" in which he showed that many salt baths at 1600 degrees Fahr. cause decarburization. In a bath of equal parts of sodium chloride, calcium chloride, and barium chloride, this effect increased with the age of the

bath. The author stated, however, that he would make no statements as to the action of these baths at lower carburizing temperatures. A fifth paper, "Thermal Treatment of the Light Alloys of Aluminum and Copper," by A. M. Portevin and Francois LeChatelier, Paris, was presented by title.

Presiding over a round table discussion during the afternoon session of the second day, R. M. Bird, engineer of tests, Bethlehem Steel Co., Bethlehem, Pa., and chairman of the society s standards committee, presented the questions and problems which the committee has had to consider during the past year. Mr. Bird said his committee had found that matters concerning heat treatment were decidedly difficult to put into concrete form with definiteness and it, therefore, felt that definite recommendations should be made as to how the standards committee should function. The committee, he continued, was unable to suggest any constructive ideas which would come under the term standard and on account of the broad character of the work it felt that efforts should be limited to cope with problems most beneficial to the society at large.

Recommend Change of Name

The committee recommended that its name should be changed from standards committee to recommended practice committee. A motion in this connection was submitted and passed pending the approval of the constitution and by-laws committee. The chairman pointed out that the standards committee must have the co-operation of the members of the society if it is to function properly. Producing and consuming interests should make up the committee which would serve merely in a judiciary capacity. Any ideas submitted to the standards committee would be presented to the society for approval and if satisfactory would be adopted tentatively for one year; if at the end of this period the standards proved satisfactory a final vote would be taken toward their final adoption by the society.

Referring to the subject of data sheets the committee feels that general definitions of heat treating terms are needed and urges that the society cooperate with other organizations to arrive at a series of definitions applying to heat treating. Hugh Tiemann, representative of the Society for Automotive Engineers pointed out the difficulty of arriving at a definition of heat treating but said that many societies are in perfect harmony. W. J. Merten, metallurgist, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. suggested the terms be confined to performance or results. H. C. Knerr, Philadelphia navy yard, Philadelphia, suggested that the definitions be fundamental and not of a narrow character.

Committee Preparing Sheet Data

The report of the subcommittee on recommended practice for the treatment of steel not including tool steel was presented by F. E. McCleary, metallurgist, Dodge Bros. Co., Detroit and chairman. The speaker outlined the progress this committee has made during the past year stating a method for preparing data sheets is about to be followed that will result in sheets of specific character.

Progress of the subcommittee dealing with pyrometry was outlined by J. H. G. Williams, Billings & Spencer Co., Hartford, Conn. and chairman. Information concerning pyrometers was published in the September issue of the society's *Transactions* and a vote of thanks was extended to Mr. Williams for the compilation of the data in this connection.

R. J. Allen, metallurgist, Rolls-Royce Co. of America, Springfield, Mass. and chairman of the subcommittee on case hardening, pointed out that his committee had attempted to set up a set of standards for checking the efficiency of carbonizing materials but little results were obtained in this direction on account of numerous difficulties and the plan soon was abandoned. He stated recommended practice sheets on the subject were being developed which likely would be ready for distribution in the near future.

Activities of the subcommittee on "Treatments of Tool Steel" were summarized by the chairman of the committee, W. J. Merten, metallurgist, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The tentative recommended practice was published in in the September issue of *Transactions*.

Wednesday afternoon's session held at Motor Square Garden and presided over by John J. Crowe, metallurgist, Philadelphia navy yards, Philadelphia, was opened by W. R. Klinkicht, foreman, heat-treating department, Pollok Steel Co., Cincinnati. The speaker in presenting his paper on "The Manufacture of Heavy Forgings" depicted the evolution of locomotive forgings from the corrugated ingot to the finished product through the medium of lantern slides and stressed the importance of the necessary precautions in their manufacture. He directed attention to the fact that railroads slowly are incorporating alloy steels in their specifications and advocated oil quenching and tempering of steels of this grade and for this particular use. After outlining the physical characteristics for various classes of forgings the speaker stated that forgings made direct from an ingot were superior to those made from a bloom.

Shows Proper Forging Heat

Mr. Klinkicht presented curves showing the time required to heat steel to the proper forging temperature, based on numerous tests and then described the important steps associated with the heating of ingots. Continuing, he traced the various operations required in the forging operation of locomotive steel, inspection, hollow boring, annealing, normalizing, quenching and the proof test. In speaking on normalizing temperatures he made it plain that these depend largely upon the carbon content of the steel under treatment. He mentioned various quenching temperatures required to meet the desired physical qualifications and described the quenching equipment used by his company. In reply to the question "of what kind of steel are locomotive forgings made," the author stated mostly plain carbon steel but that carbon-vanadium steel continually is growing into better favor.

In discussing whether quenching can be accomplished successfully in water the same as in oil, J. F. Harper, metallurgist, Allis-Chalmers Mfg. Co.,

New Officers

AMERICAN SOCIETY FOR STEEL TREATING

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GEORGE K. BURGESS

Director, bureau of standards, Washington.

First Vice President

*R. J. ALLEN

Metallurgist, Rolls-Royce Co. of America, Springfield, Mass.

Second Vice President

ROBERT M. BIRD

Engineer of tests, Bethlehem Steel Co., Bethlehem, Pa.

Secretary

*W. H. EISENMAN

4600 Prospect avenue, Cleveland.

Treasurer

ZAY JEFFRIES

Research engineer, Aluminum Co. of America, Cleveland.

Directors

*S. M. HAVENS

Assistant treasurer and manager, Ingalls-Shepard Division, Wyman-Gordon Co., Harvey, Ill.

*F. P. GILLIGAN

Secretary-treasurer, Henry Souther Engineering Co., Hartford, Conn.

J. FLETCHER HARPER

Research engineer, Allis-Chalmers Mfg. Co., Milwaukee.

T. D. LYNCH

Research engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

*Continues in office.

Milwaukee, stated a 42-inch gear with a carbon range from 0.45 to 0.55 per cent has been satisfactorily quenched in water. Mr. Lilly stated that shafts for battleships, locomotive parts and shafts for stationary engines have been quenched and tempered successfully in both oil and water but the kind of quenching medium depends largely upon the different stages of manufacture and the quenching temperatures.

The final paper on Wednesday afternoon's schedule was presented by L. V. Foster, Bausch & Lomb Optical Co., Rochester, N. Y. The author spoke on "Transparent Metallography" and described a unique method by which replicas of etchings could be preserved indefinitely. A polished or etched specimen, the speaker related, is coated with a layer of collodion by applying with a camels hair brush and then placed in distilled water. The film then is stripped off the cast by forceps, placed on a microglass and cemented along the edges with collodion. The glass then is allowed to remain in a drying cabinet for 12 hours or more after which the replica will be ready for use or for filing away for future reference. Several specimens produced by the foregoing method were shown on the screen.

Discuss High-Speed Steel

Delegates attending the technical session Thursday morning at the William Penn hotel were called to order by Prof. H. M. Boylston, Case School of Applied Science, Cleveland, chairman. After calling attention to the numerous requests received by the publication committee to have more papers of a practical character presented before the society's annual meetings, Prof. Boylston turned the meeting over to H. J. French, physicist, bureau of standards, Washington. Mr. French spoke on "Effect of Heat Treatment on Lathe Tool Performance and Some Other Properties of High-Speed Steels" which was prepared jointly by himself; Jerome Strauss, materials engineer, United States naval gun factory, Washington; and T. G. Digges, assistant physicist, bureau of standards, Washington.

In speaking on this subject Mr. French stated the report supplemented a paper on high-speed steel which was presented last year at the society's annual meeting in Detroit. His remarks were based on a lengthy study of heat-treating high-speed steels and were convincing to the extent that time and temperature are two important phases to consider in hardening high-speed steel. Variations resulting from tempering at different temperatures were presented by graphs and tables thrown on the screen. Mr. French's paper provoked considerable discussion.

Causes of secondary hardness were advanced by E. C. Bain, research metallurgist, Atlas Steel Corp., Dunkirk, N. Y., in his paper on "Secondary Hardness in Austenitized High-Chromium Steels." Mr. Bain presented a series of tests representing compilation of Rockwell hardness and showed numerous micrographs of specimens quenched for maximum hardness. The tests, as explained by the speaker, of a steel with 10 per cent chromium and 2 per cent carbide included in its chemical constituents attained its maximum hardness at a quenching temperature of 1800 degrees Fahr. when in the martensitic state. Mr. Bain's paper brought out considerable discussion including the question as to whether the constituent obtained by hardening would be classified as martensite or troosite.

Hardness Is Defined

A paper entitled "The Hardening of Steel" prepared jointly by Zay Jeffries and R. S. Archer, research bureau, Aluminum Co. of America, Cleveland was presented by the latter. Mr. Archer in defining hardness said that hardness is resistance to permanent deformation. Briefly, he stated a general theory of the hardening of metals and presented in detail a conception of the character of hardened steel and of the causes for its hardness. He directed attention to the fact that the softening of hardened steel by tempering is due to the growth of alpha iron grains and of cementite particles. The paper is presented in full full in the September Transactions.

Other papers included in Thursday morning's session and presented by title dealt with "Crystallization of Iron and Its Alloys," by Albert Sauveur, professor of metallurgy, Harvard university, Cambridge, Mass; and "X-ray Examinations of Steel Castings" by F. C. Langenberg, metallurgist, Watertown arsenal, Watertown, Mass.

Holds Symposium on Hardness Testing Methods

A SYMPOSIUM on "Hardness Testing" was held Thursday afternoon, Maj. A. E. Bellis, Bellis Heat Treating Co., New Haven, Conn., presiding. The session was opened by E. G. Herbert, Manchester, Eng., who exhibited a Herbert-type pendulum hardness testing machine, pointing out the details of operation. Recent developments along the lines of magnetic testing of hardness and brittleness were presented by A. V. de Forest, research engineer, American Chain Co., Bridgeport, Conn. The speaker outlined in detail the part that the hardness test plays in the selection and the heat treatment of a steel for a particular purpose.

Average hardness and the range in hardness that can be expected in annealed and in hard-rolled brass of various tempers was explained by A. L. Davis, metallurgist, Scovill Mfg. Co., Waterbury, Conn. Mr. Davis in speaking on "The Hardness of Common High Sheet Brass" said that the hardness of this alloy of a given composition is due to cold work together with the greater or less degree to which such work has been relieved by annealing. In annealed brass, as cited by the speaker, its previous history as to annealings and to the stages and amounts of cold rolling, exerts a notable influence on the resulting hardness. In hard-rolled brass, he stated, the hardening effect of rolling varies slightly according to the absolute thickness of the bar and to whether a given percentage of reduction is made in a single pass or in several lighter passes.

Explains Hardness Testing

The final paper on Thursday afternoon's program entitled "Testing of Steel for Hardness" was presented by H. M. German, metallurgist, Henry Disston & Sons, Inc., Philadelphia. He described how various hardness testing apparatus including the Brinell and Rockwell types and the scleroscope operate and pointed out the details in each machine and how errors are introduced.

Miscellaneous subjects were discussed at the Friday morning session held at the William Penn hotel with Paul D. Merica, serving as the chairman. "Carbon-Vanadium Steel Castings—A Comparison" by J. M. Lessells, mechanical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was the first paper presented. The physical properties of the two steels were compared and the recommended uses for each given. In an interesting paper, "Investigation of the Treatment of Steel for Permanent Magnets" by R. L. Dowdell, instructor in metallography, University of Minnesota, Minneapolis, Minn., reported a series of tests conducted upon a number of steels and their heat treatments to determine the types most suited to magnet manufacture. Much of the work was done with the usual grade of chrome magnet steel.

One of the points stressed was that the higher the quenching temperature above the critical point, the less the loss in magnetism.

Vincent T. Malcolm, metallurgist, Chapman Valve Co., Indian Orchard, Mass., read a paper "Physical Properties of Metals at Elevated Temperatures," Davis metal, monel metal, bronze anl cast steel being the chief metals investigated. Both Davis metal and monel were found to function satisfactorily in the field at elevated temperatures. Lead was used to replace copper in Davis metal with results not satisfactory. Bronze was found to be treacherous above 400 degrees Fahr., while cast steel stood up well. A paper "Protective Coatings for Selective Carburization," prepared by J. S. Vanick and H. K. Herschman, metallurgist and assistant physicist, United States bureau of standards, Washington, and read by Mr. Vanick, showed results of an investigation to determine the most satisfactory coating for carburization. Several refractory coatings were used but it was found that all were susceptible to penetration and, therefore, could not be used for that work. Copper plating, however, was found to be effective, and extensive tests were run using various thicknesses of deposited copper for work that required long carburizing periods. Discussion provoked by the paper showed that copper plating had not always proved effective in certain classes of work due to the fact that it was not possible to deposit a sufficiently thick coating of copper on the metal in the time allowed.

Study Aging of Castings

In an effort to determine the aging or seasoning effect on steel forgings and castings, W. P. Wood, department of metallurgy, University of Michigan, Ann Arbor, Mich., is conducting an investigation using a number of various types of steels. Although the tests have not reached a point to which definite conclusions can be drawn, the progress made thus far was reported in a paper "The Seasoning of Steel" and presented by Mr. Wood. He showed that in spite of the fact no obvious reason can be given for aging or seasoning, the tentative results show that appreciably higher ductility is obtained on steel that has been aged. Test samples of the various steels were made up and tested immediately for tensile strength, elongation and reduction in area while samples of the same steels were allowed to age for one year. Tests made at the end of the year showed practically no change in the tensile strength but did show greater elongation and reduction in area. In discussion it was brought out that in conducting further tests it would be desirable to determine also the relative elastic limits and ultimate strengths.

"Conical Illumination in Metallography" was the title of a paper read by H. S. George, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y. The final paper on the Friday morning program, "Theory in Quenching Steels," prepared by Kotaro Honda, Tohoku Imperial university, Sendai, Japan, was presented by title only but will be published soon.

Hold Session on Education

The Friday afternoon session was held in the meeting room at Motor Square Garden and took the form of a symposium on metallurgical education and dealt particularly with the work of technical schools. Prof. S. L. Goodale, Carnegie Institute of Technology, Pittsburgh, presided at this meeting. The discussion was informal in character but much valuable information was brought out. The present day idea seems to be to limit curriculum work to the more important subjects in the course, with an idea to developing trained metallurgists. On the other hand, a plea was made for less foreign language but more work in the English language, in order that the students can give better expression of their thoughts both orally and written, this being one of the weaknesses of the majority of technical graduates today.

A. E. Crockett, Jones & Laughlin Steel Corp., Pittsburgh, stated that his company received the technical graduate as the schools produced them and that he had been in a position to study their progress in the industry in detail. His criticism was that the university courses were too theoretical and urged that a greater effort be made to point out the relation between the theoretical work and its practical application in the manufacture and treatment of iron, steel and other metals. In concluding, he cited several examples of how students received renewed interest in their work after being shown the application of that work in industry. Mr. Crockett's remarks were followed by a paper, "A Discussion of Metallurgical Education" written by Prof. Oscar E. Harder, department of metallurgy, University of Minnesota, Minneapolis, Minn., and read by R. L. Dowdell, instructor of metallurgy at the same university.

At 4 p. m. on Friday afternoon committee A-4 on the heat treatment of iron and steel of the American Society for Testing Materials held a meeting with Prof. H. M. Boylston, head of department of mining and metallurgy, Case School of Applied Science, Cleveland, its chairman, presiding. Nothing more than routine business of the committee was discussed, the purpose of the meeting being to outline the work to be conducted by that committee during the coming year.

Some 600 members of the society and guests attended the annual banquet which was held in the ball room of the Fort Pitt hotel on Thursday evening. T. D. Lynch, retiring president of the society was master of ceremonies, and George Nielson, formerly president of the Braeburn Steel Co., Braeburn, Pa., and past president of the Engineers Society of Western Pennsylvania, was toastmaster. President Lynch reviewed the establishment of the Henry Marion Howe medal by the board of directors some time ago, this medal to be presented each year to the member of the society presenting and having published in *Transactions* the paper of most merit. The late Doctor Howe was an honorary member of the society. Mr. Lynch then presented Mrs. Howe, the widow of Doctor Howe, a bronze replica of the gold medal. The first medal for 1922 was then presented to E. J. Janitzky, metallurgical engineer, Illinois Steel Co., East Chicago, Ill. The recipient of the medal for 1923 was not announced.

Capt. Irving O'Hay, well known humorist, and Gifford Pinchot, governor of the state of Pennsylvania, were speakers at the banquet.

Link-Belt Co. Purchases Meese & Gottfried Co.

Link-Belt Co., Chicago, manufacturer of general elevating, conveying and power transmission machinery, cranes, gears, etc., has purchased the Meese & Gottfried Co., San Francisco, Los Angeles, Seattle and Portland. The Link-Belt Co. distributed its products formerly on the West coast through its subsidiaries, the Link-Belt Northwest Co., Seattle, and the Link-Belt Pacific Co., San Francisco. The Meese & Gottfried Co. and its predecessors have manufactured and distributed conveying and power transmission machinery on the coast for more than 40 years.

A new organization to be known as the Link-Belt Meese & Gottfried Co., with headquarters at San Francisco, has been formed to conduct the western business of the Link-Belt Co. and the business of the Meese & Gottfried Co. Charles Piez, president of the Link-Belt Co., Chicago, is chairman of the board of the new company, with B. A. Gayman president, Harold H. Clark, vice president and sales manager, Leslie W. Shirley, treasurer and Richard W. Yerkes, secretary.

Bar Unfit Alien at Home Says Davis

Secretary of Labor Would Have Immigration Selective or Forbidden Completely—Proposes Enrollment and Supervision—Greatest Need for Laborers and Such Classes Should Be Admitted, Barring All Who Cannot Become Citizens

WASHINGTON, Oct. 16.—As part of his program for selective immigration, Secretary of Labor James J. Davis declared in an address yesterday at San Francisco, before the convention of the American Legion, that he would provide first for the admission of families of aliens already in the United States; second for unskilled labor, where labor of this kind cannot be found unemployed in the United States; and for men who will come to the United States to do common labor. He advocated, however, that every immigrant be subjected to strict mental, moral and physical tests, which must be maintained to keep up American standards of health and living.

Secretary Davis upheld his policy of a selective system of immigration and declared that if the United States cannot have selected immigration he would favor an absolute bar on all immigration to this country.

"I would absolutely bar out the alien, who under our laws, cannot win citizenship, or who by mental, moral or physical defect would lower the standards of America," said Secretary Davis. "I would admit to America only the alien who is able and willing to accept American customs and American ideals. I would take this stand now and adhere to it forever, no matter what numerical limitation might at any time be placed upon the immigrant to be accepted."

The secretary outlined a program based upon the examination of every prospective immigrant before he leaves his native land, which would tend to help end the distress incident to the alien's rejection at American doors, he declared. Included in his program, Secretary Davis said he favors granting power to United States consuls to refuse to honor passports to prospective immigrants when it is clear that the individual is ineligible. He also said he would enroll every alien, upon his arrival in this country, and would provide for an annual census of all aliens over a period of five years, during which the alien would be subject to deportation if found to be in America illegally or for an unlawful purpose.

"Under this plan," said Secretary Davis, "I would give preference to certain classes. For so long as the youth of America declines to work with his hands, and insists upon 'white collar' jobs, we must have aliens to perform our common labor. Last year we accepted some 70,000 Mexicans—for there is no quota limitation on immigration from countries of the western hemisphere. Would we not be better off with 70,000 sturdy, upstanding men from western Europe?

"Of our nearly 14,000,000 foreign born, less than half are naturalized American citizens. Our records indicate that the average alien is in this country 10 years before he assumes the duties and responsibilities of citizenship. Clearly there is something wrong with a system which permits this vast undigested mass of alien population to continue undigested year after year."

Secretary Davis referred to the underground network by which aliens are smuggled into this country. He said it has been conservatively estimated that 100 individuals daily are coming into the United States in violation of the law. Some authorities are of the opinion that at times it runs as high as 1000 daily, he added. As a means of eliminating this smuggling of aliens, Secretary Davis urged that the federal government be empowered to enroll every alien upon his arrival and issue to him an identification card which will establish his rights.

Germans Unload as Home Buying Stops

Washington, Oct. 16.—While it is not believed the unloading of German stocks of goods will have any serious effect generally upon world trade, dumping of German manufactured products on the markets has begun, forced by lessened domestic demand in Germany and necessity for lowering prices in order to compete elsewhere, according to a cabled report to the department of commerce from C. E. Herring, commercial attache at Berlin. The quantity is not believed to be sufficiently large, however, to cause a disturbance.

Electrical goods, heavy machinery and automobiles are being quoted at lower export prices, reductions amounting to 30 per cent in some instances. This dumping, it is said, can only be temporary, since there is no possibility of raising domestic prices, as has been done heretofore, to compensate for losses which are incurred on exports.

New export restrictions on foodstuffs, raw materials and semifinished material necessary to the German finishing trade, effective Sept. 27, now are in operation. They replace all previous regulation of exports. The complicated machinery of the Aussonhandelsstellen has been abolished and control of exports for the purpose of collecting the 26 per cent tax payable to the allies will have to be obtained otherwise, states Commercial Attache Herring. Restrictions applying to opium, war materials and other classifications remain unchanged.

Rate Increase Is Denied by Commission

Washington, Oct. 16.—Proposed increases of about 6 per cent in freight rates on iron and steel products from the Pittsburgh district to Norfolk, Newport News, Richmond, Lynchburg and Roanoke, Va., have been found not justified by the interstate commerce commission and the schedules have been ordered suspended, and the proceedings cancelled.

The increases were proposed on shipments originating at Bellaire, O., Erie, Pa., Buffalo and Olean, N. Y., Lockhaven and Duncannon, Pa., Cumberland, Md., and Fairmont, W. Va. They were an outgrowth of demands on carriers operating routes from Pittsburgh to Virginia cities by way of junctions in central territory, by iron and steel producers in the Mahoning and Shenango valleys and southern Ohio for rates equal to those applying from Pittsburgh over eastern routes. The carriers then filed increased schedules on routes to the Virginia cities and related points to meet the rates over central routes.

Czechs Export Steel

Washington, Oct. 16.—Iron and steel exports from Czecho-Slovakia for the first half of 1923 amounted to 330,020 metric tons, according to a report received by the department of commerce from H. L. Groves, acting commercial attache. Of the total, 180,000 tons went into Germany, 35,000 tons to Poland, 20,800 tons to Roumania, 15,300 tons to Hungary, 14,600 tons to Austria and 8200 tons to Switzerland.

Price Reduction

On Refractories Are Announced by Makers—Some Deferred Orders Placed

Pittsburgh, Oct. 16.—Several users of both fire clay and silica refractory brick have placed orders for requirements over a month or two on which they have been delaying action for some time past awaiting price reductions. Brick producers acceded to the market trend last week by reducing their levels $3 per thousand. Chrome and magnesite brick remained unchanged at $50 and $65, respectively, with interest of buyers confined mostly to single carloads. Silica brick orders are fair involving 50,000 to 250,000 pieces at a time, one typical order for special shapes calling for 70,000.

One comparatively large order placed here by a Youngstown, O., user involved 250,000 silica brick for November shipment. This order had been hanging fire for about a month awaiting a lower price. A Weirton, W. Va., consumer bought about 200,000 each fire clay and silica brick, dividing the order among three large producers. Most users of brick, however, protected themselves at least to the end of the year and as yet owe specifications on these contracts. Others have fair sized stocks of both open-hearth and blast-furnace material and defer placing their future business.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$42.00 to 45.00
Pennsylvania, No. 2	37.00 to 42.00
Ohio, No. 1	42.00 to 45.00
Ohio, No. 2	37.00 to 39.00
Illinois, No. 1	45.00 to 48.00
Illinois, No. 2	42.00 to 44.00
Kentucky, No. 1	42.00 to 44.00
Kentucky, No. 2	37.00 to 39.00
Missouri, No. 1	40.00 to 42.00
Missouri, high grade	45.00 to 50.00
Maryland, No. 1	47.00 to 50.00
Maryland, No. 2	42.00

SILICA BRICK

Pennsylvania	42.00
Chicago	49.00
Birmingham	50.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

Awards Service Pins

The Brown & Sharpe Mfg. Co., Providence, R. I., has presented 268 of its employes who have been in the service of the company for 25 years or more, service emblems in the form of a gold pin. These pins represent periods of service of 25, 30, 40 and 50 years, each in a different colored background, to indicate the length of employment, besides figures stamped on the pin giving the period of service. The distribution was divided as follows: 50 years, 1; 40 years, 20; 30 years, 116; 25 years, 131.

Labor Difficulty Affects Australian Works

Newcastle, South Wales, Sept. 28.—Reduction of working hours without subsequent reduction in scale of wages and other labor troubles were largely responsible for the closing of the steelworks here of the Broken Hill Proprietary Co., Ltd., according to the annual report to the stockholders at Melbourne, Australia, covering operations for the 12 months ended May 31. Operations have since resumed.

Rates of wages had been and were being largely increased with each arbitration award, the hours of labor having been reduced to 44 per week at the time of the closing with the same wage as had been paid for the 48-hour week. The price of small coal for industrial purposes was at a figure beyond that ruling in other countries competing with the Broken Hill company. At the time of closing the works the basic wage fixed by the board of trade in New South Wales was £4 5s per week. The new award enabled a reduction to be made in the basic wage which now is £3 19s.

During the time that the company was shut down new equipment and improvements were installed. The slime dumps from which lead and zinc concentrates have been produced during the last two years will be exhausted soon, but there still remains about 60,000 tons available. The tailing dumps, material from which has been reground in the mills and subsequently treated in the zinc flotation plant, contain sufficient supplies to last at least six months.

Production of coke and by-products for the four weeks ended Aug. 15 with an average of 214.26 coke ovens in operation was: Coke, 23,876 tons; tar, 298,177 gallons, sulphate of ammonia, 422 tons, and benzol, 42,450 gallons. With two blast furnaces in continuous operation, pig iron output was 24,234 tons. The average number of open-hearth furnaces in operation was 5.96 having a production of steel amounting to 23,797 tons. The rail mill produced 12,615 tons of billets, rails and beams, the rod mill, 4999 tons of rods and the merchant mills 10,916 tons. From Iron Knob 33,789 tons of iron ore was shipped to the Newcastle works.

Prices Unchanged

In By-Products Market—Naphthalene Inquiry Improved

New York, Oct. 16.—Notwithstanding continued dullness in the coal tar by-products market, prices are nominally unchanged. The market on pure benzol is still quoted at 23 cents works in tanks and 28 cents in drums; and on 90 per cent benzol, 21 cents in tanks and 26 cents in drums. These prices are being shaded one and two cents on scattered tank car lots. Toluol is quoted at 30 cents in tanks and 35 cents in drums; with solvent naphtha holding at 27 cents in tanks and 32 cents in drums and commercial xylol at 29 cents in tanks and 34 cents in drums.

While buying of sulphate of ammonia remains dull, a slight improvement in demand is expected to develop later in the month, at which time the fertilizer manufacturers are expected to come into the market for materials to round out their annual contracts. Export demand continues at a standstill. The market may be quoted nominally at $2.95 to $3, works for material for domestic account, and $3.25 to $3.30 port, for material in double bags for export.

Inquiry for naphthalene is slightly improved, due to the activity of the drug trade in meeting the demands of the fall cleaning season, but prices are unchanged at 8½ cents works for balls and 7½ cents for flakes.

Coke Oven By-Products

Spot*

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.23
Toluol	0.28 to 0.30
Solvent naphtha	0.25 to 0.27
Commercial xylol	0.27 to 0.29

Per Pound at Producers' Plants

Phenol	$0.26 to $0.28
Naphthalene flake	0.07½
Naphthalene balls	0.08½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.00 to $3.05

Contract

Pure benzol	$0.23
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.28
Naphthalene flake	0.07½
Naphthalene balls	0.08½

*Spot distillates are subject to shading.

Percival Wilds has been appointed receiver of the Willened Mfg. Co., Inc., metal lithographers, New York. Liabilities are about $75,000 and assets about $50,000.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

H. F. DEVENS, who on Oct. 15 resigned as manager of hot and cold-rolled strip steel sales in the East for the Superior Steel Corp., Pittsburgh and Carnegie, Pa., to become associated with the Oliver Iron & Steel Co., Pittsburgh, as general manager of the plant at Wilson Station, Pa., of the Morris & Bailey Steel Co., and to succeed G. B. Morris who retires as vice president of the latter organization, had been affiliated with the Superior company since 1906. At that time and before the city offices were established, Mr. Devens was manager of sales at the mill at Carnegie, then conducted as the Superior Steel Co. When the company was reorganized in December 1916 as the Superior Steel Corp., he was elected vice president in charge of eastern sales. A later change in office personnel left him as manager of eastern strip sales. Before becoming identified with the Superior organization, Mr. Devens for about five years was general purchasing agent of the National Cash Register Co., Dayton, O., and prior to that spent about 10 years as purchasing agent for the Yale & Towne Mfg. Co., Stamford, Conn. Mr. Devens is a member of the American Iron and Steel institute and of the Engineers' club of New York. Mr. Morris, whom Mr. Devens succeeds, and also a member of the American Iron and Steel institute, makes no announcement concerning future plans at the present time.

Judge E. H. Gary, chairman of the board of the United States Steel Corp., celebrated his seventy-seventh birthday, Oct. 8.

George O. Crosby Jr., has resigned as superintendent of the Stockbridge Machine Co., Worcester, Mass., with which he has been connected for 16 years.

Arthur P. Lamneck, secretary and treasurer of W. E. Lamneck Co., Columbus, O., furnace manufacturer, was appointed chairman of the chamber of commerce forum of that city recently.

J. F. Gaffney, who for the last three and one-half years was superintendent of the Bethlehem Steel Co.'s foundry at Sparrows Point, Md., has resigned. Mr. Gaffney contemplates a month's vacation before taking up other work.

Richard W. Yerkes, recently appointed treasurer of the Link-Belt Co., Chicago, to succeed B. A. Gayman, was formerly general manager of the company's Philadelphia plant. Mr.

H. F. DEVENS

Gayman was selected by Charles Piez, president of the Link-Belt Co., to head the newly acquired Meese & Gottfried Co., San Francisco, now operating under the name of Link-Belt, Meese & Gottfried Co.

Louis R. Davidson, president Union Drawn Steel Co., Beaver Falls, Pa., has been elected a member of the board of directors of the Bank of Pittsburgh to succeed the late F. N. Beegle.

George B. Norton, formerly director of sales of the Witherow Steel Co., Pittsburgh and Neville Island, Pa., is now associated with Clapp, Dulany & Co., Union Trust building, Pittsburgh, dealers in bonds and investment securities.

R. D. Mock, formerly vice president of the Hydraulic Pressed Steel Co., Cleveland, and now vice president of the Bessemer Motor Truck Co., Grove City, Pa., has taken charge of the plant at Kenosha, Wis., of the newly organized Winther Motor Co.

N. S. Bates recently made factory manager of the Hartford Special Machinery Co., Hartford, Conn., was formerly connected with the Pratt & Whitney Co., that city. He was with the latter organization since 1902 where he recently held the position of superintendent of equipment.

Walter V. Houck, recently made sales engineer for Crane-Schiefer-Owens, Inc., Buffalo, N. Y., manufacturer of machine tools, was formerly chief engineer and production manager of King Sewing Machine Co., works manager of the Sterling Engine Co., and general manager of the Buffalo Metal Goods Co., all of Buffalo.

E. A. Langenbach, chairman of the board of directors of the United Alloy Steel Corp., Canton, O., was elected a trustee of the McKinley National Memorial association at a recent meeting of that body in Canton. H. H. Timken, chairman of the board of the Timken-Detroit Axle Co., was elected vice president of the association.

Robert A. McDonald has severed his connection with the Crucible Steel Co. of America, Pittsburgh, as general superintendent, and will take an extensive vacation before resuming active business. He was formerly superintendent of the old company of Miller Metcalf & Parkin and later was manager of the Crescent works of the Crescent Steel Co. and manager of the Black Diamond works of Park Bros. & Co. He was also at one time manager of the Pittsburgh Crucible Steel Co.

F. H. Herzsch has entered the firm of Dudley-Curry Electric Co., 409 Broadway, New York. This company has for many years been operating as sales agent for manufacturers of electric motors, generators and accessories and are now representing the Northwestern Mfg. Co., Milwaukee, and the Electric Specialty Co., Stamford, Conn., in New York territory. Mr. Herzsch is a graduate of Purdue university and has served as commercial engineer for the Westinghouse Electric & Mfg. Co. and the Wagner Electric Corp. For the past five years he was connected

with W. B. Connor, Inc., manufacturers' agents in New York.

Stuart E. Frost, owner of the Frost Drive Co., Worcester, Mass., has sold the business to the Bird Machine Co., South Walpole, Mass., and has become manager of its pulmax department.

William G. Mather, president of the Cleveland-Cliffs Iron Co., Cleveland, was one of the speakers at the annual meeting of the American Antiquarian society to be held in Worcester, Mass., Oct. 17.

William J. Watkins, recently appointed superintendent of the steel foundry of the Lorain Steel Co., Lorain, O., succeeding G. W. Merrefield, resigned, has been an employe of that company since 1889.

Richard B. Sheridan, formerly in charge of the metallurgical laboratory of J. H. Williams & Co., in its works at Brooklyn, N. Y., has joined the metallurgical staff at its works in Buffalo, N. Y.

Ralph E. Day, superintendent of one of the Waterbury, Conn., plants of the American Brass Co., is to be transferred to the National Conduit & Cable Co., Hastings-on-the-Hudson, N. Y., which was recently acquired by the American Brass Co.

John Last, president of the newly organized Jolite Tool Co., Milwaukee, marketing agency for the recently organized Jolite Co., Inc., that city., was formerly a salesman and demonstrator for an eastern steel company. Mr. Last is inventor of a heating process for steel, the treating to be carried on by the Jolite Co., Inc.

Earl Spencer, formerly assistant general superintendent at Buffalo, N. Y., of the Pierce-Arrow Motor Car Co., and recently manufacturer of a kerosene burning car in Tokio, Japan, has joined the organization of George B. Morris, 316 Azusa street, Los Angeles, Pacific coast representative for eastern manufacturers.

H. G. Hill, who has been connected with Pratt & Whitney Co. on the Pacific coast for the past seven years, has been appointed sales manager for that company for all the territory in the state south of Bakersfield and for the entire state of Arizona. His headquarters will be located at 454 East Third street, Los Angeles.

John D. Babbitt, for 21 years connected with the Joseph Reid Gas Engine Co., Oil City, Pa., and Robert R. Dempsey for 12 years with the Butler Engine & Foundry Co., Butler, Pa., have purchased the plant of the Johnsonburg Machine Co., Johnsonburg, Pa. A general line of jobbing castings in gray iron, brass, and bronze will be made and a machine shop will be conducted for handling repair work.

Frank R. Frost, who has been made general sales manager of the Superior Steel Corp., Pittsburgh and Carnegie, Pa., announced in IRON TRADE REVIEW last week, has been affiliated with the company for about seven years. His connection dated from shortly after its incorporation in December 1916. While always identified with the sales department, lately Mr. Frost has been manager of hot and cold-drawn steel sales in the West. Prior to 1916 and ever since Mr. Frost was graduated from

FRANK R. FROST

Allegheny college in 1905, he was engaged in engineering and tube manufacturing lines of activity. He is a member of the Society of Automotive Engineers and is also a director of the Superior Steel Corp.

H. F. Pankhurst, after 30 years of service with the American Ship Building Co., Cleveland, has resigned from that company where he lately held office as treasurer. He intends to take a vacation and has no plans for the immediate future. F. M. Secrest is retiring as secretary of the company to resume the practice of law. Mr. Secrest graduated from Ohio State university and was for eight years in charge of the office of the industrial commission of Ohio. At the annual meeting of the American company in Jersey City, N. J., recently, all of the old directors and officers were re-elected excepting the resignations noted. James E. Davidson, was elected secretary and treasurer in addition to his duties as senior vice president. He is president of the People's bank, Bay City, Mich.

Carnegie Steel Co. Asks Rate Refund

Washington, Oct. 16.—In a complaint filed with the interstate commerce commission, the Carnegie Steel Co., asks reparation in the sum of $240,574, with interest at 6 per cent, from the Pennsylvania and other railroads for alleged discriminatory and excessive freight rates on coal shipped to the company's by-product coke and steel plants at Clairton and Munhall, Pa., during the nationwide coal strike in 1923.

The company was forced to enter the Ohio, Virginia, West Virginia and Kentucky soft coal markets, the complaint charges, because of the western Pennsylvania union mines being tied up by the strike. No joint through rates from these territories to the company's plants existed at that time. Later these were put into effect in less than the statutory time by some of the roads, but not until it was necessary to ship large tonnages of coal to keep the company's plants in operation, says the petition.

It is further complained that an arbitrary rate of 30 cents a net ton above that prevailing in the Pittsburgh rate district was assessed, affecting the company in a competitive way.

The Pennsylvania, Chesapeake & Ohio, Williamson & Pond Creek, Norfolk & Western and several other railroads are made defendants.

Pittsburgh Steel Shows Increased Sales

The annual report of the Pittsburgh Steel Co. and subsidiary companies for the fiscal year ended June 30, 1923, just issued, shows net income for the year of $2,022,473, after charging off for depreciation and depletion $1,427,092, reduction of inventory values $97,840 and including in operating costs $2,822,681 for maintenance, repairs and replacements. After payment of the regular dividends of 7 per cent on the preferred stock and 4 per cent on the common stock, amounting to $1,295,000, there remained a balance of $727,473, which was added to surplus. Total sales for the year were $29,117,116, being an increase of $13,176,172 over the previous year. The company has current assets of $14,116,406, against current liabilities of only $2,566,032.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE plant of the Perfection Spring Co., Cleveland, is being revamped by the Eaton Axle & Spring Co., that city, which on Aug. 1, acquired the business of Cox Bros. Mfg. Co., automobile bumper manufacturer, to absorb the manufacturing of bumpers. The new arrangements are expected to increase the spring output per day and also to provide for production of 2000 bumpers daily. Improvements are being made in the plant at Albany, N. Y., which will permit manufacture of 500 bumpers daily.

* * *

ACTIVE operation is being pushed by the Midgley Steel & Wire Co., 339 Main street, Worcester, Mass., manufacturer of wire products. The company was organized about six months ago.

* * *

HILLSEN & SANDSTROM, Worcester, Mass., was recently organized to turn out high grade brass, bronze, copper, aluminum and composition castings. A plant has been established at 80 Ellsworth street, and production begun.

* * *

THE Silent Washer Co., Clintonville, Wis., manufacturer of power and manual washing machines for domestic purposes, has been reorganized as the New Silent Washer Co., with $30,000 capital stock. Julius H. Spearbraker, Henry Kuth and T. L. Teleson are the incorporators of the new organization.

* * *

THE superior court of Massachusetts has authorized the receivers for Stevens-Duryea, Inc., Willimansett, Mass., builder of automobiles, to sell the property to a syndicate for $450,000. The syndicate is composed of Ray M. Owens and Roy A. Rainey of W. J. Rainey, Inc., both of New York, and R. W. Stanley, Holyoke, Mass. The corporation will be reorganized and the business continued. Mr. Owens is a former automobile builder.

* * *

THE G. F. Wright Steel & Wire Co., 243 Stafford street, Worcester, Mass., manufacturer of wire products, has completed a large addition to its plant. The company has been organized but two years and reports a steadily increasing business. Officers of the company are George F. Wright, president and general manager, A. B. Peavey, vice president and sales manager, and Herbert N. Wright, treasurer.

* * *

PROPERTY of the Jackson Motor Shafting Co., Detroit, formerly owned by the Earl Motors, has been purchased by a new company composed of Otto L. Schulz, Charles H. Franklin, and Charles Neuman. The company will continue to manufacture crank and cam shafts and there will be no change in management of operation. Orders on books indicate capacity operation until after Feb. 1, 1924.

* * *

THE New England High Carbon Wire Co. has purchased the property of the former Millbury Rubber Co., in Millbury, Mass., which has been idle for several years, and will begin operations as soon as the buildings can be put in condition. Carl T. Lund, who has been a foreman for the American Steel & Wire Co., Worcester, Mass., is the organizer of the new company and will be general manager. The company plans to erect two additional plants and expects to be in full operation by Jan. 1.

* * *

A 2-STORY building was recently completed for the Federal Iron Works, Inc., 119 First street, East Cambridge, Mass., the ground floor of which is being used for a structural shop and the second floor for light ornamental iron work. This addition allows 14,000 square feet more floor space and materially increases the capacity of the plant. The labor force of the company has been more than doubled since the first of the year due to a greatly increased business.

* * *

THE Johannson Gauge Co., with home offices in Sweden and a manufacturing plant at Poughkeepsie, N. Y., has been purchased by the Ford interests, according to recent announcement of Henry Ford. The company manufactures precision instruments. The purchase of the Johannson company, it is announced, will enable refinements not now existing to be incorporated in the automobiles produced by the Ford company. The Johannson company was one of the pioneers in standardizing limit gauges, the work being started between 30 or 40 years ago.

* * *

APPROXIMATELY $100,000 loss was caused when fire recently damaged the plant of the Amco Mfg. Co., 1022-1050 East Michigan street, Indianapolis, manufacturer of rebound checks, radiator shutters and automobile bumpers. The fire damaged all the stock on hand, both raw materials and units in process of assembly. Arrangements for a new and more modern factory have been made and considerably more floor space will be available.

* * *

MULLINS MFG. CO., Brillion, Wis., maker of steel stanchions, watering devices for cattle, etc., has been taken over by the Berg Supply Co., Marshfield, Wis., which makes a general line of metal barn and stable equipment and general farm devices. The machinery and stock will be moved at once from Brillion to Marshfield and installed in a new building which the Berg company erected during the summer for general enlargement of its own works. Plans are to erect another addition early next spring.

* * *

COLUMBIA MOTORS CO., Detroit, which recently purchased the plant and other assets of the defunct Liberty Motor Car Co., has taken possession of the property and in a short time will be producing both Liberty motor cars and Columbia cars from this plant. The present plant of the Columbia Motors Co., was leased and will be abandoned. The new plant is said to be one of the highest type of mechanical shops for automobile assembling in the country. The plant and offices occupy about eight acres. Additional 16 acres of ground adjoining probably will be disposed of. The Columbia company is assembling Liberty motor cars from material on hand purchased by the receiver. Its combined production is about 25 cars daily. Officials say this will be increased about the first of the year when complete operations will be conducted in the new plant.

German Exports More Favorable

Shipments of Iron and Steel Including Scrap Fall Steadily from 236,709 Tons in January To Low Level in June with 107,151 Tons, but Recover to 131,870 Tons in July—British Exports Increase and Imports Decrease

European Special Service

BERLIN, Germany, Oct. 5.—Germany's exports of iron and steel including scrap were 107,151 metric tons in June compared with 135,605 tons in May, 143,212 tons in April and 236,709 tons in January. The figure for June is the lowest since the first year after the war and is 55,146 tons less than the output for June, 1921.

According to official statistics Germany's exports of iron and steel products for the first six months of 1923 amounted to 976,392 tons, compared with 1,234,332 tons for the corresponding period of 1922, a decrease of 257,940 tons. This decrease is due to the occupation of the Ruhr.

Germany's imports in June amounted to 141,442 tons, or 34,291 tons more than the exports for the same month. In May the imports were 134,927 tons, in April 154,288 tons, and in January 287,647 tons. The imports for the first six months of this year amounted to 927,056 tons, compared with 910,798 tons for the corresponding period of 1922.

Exports of iron and steel products from Germany in July totaled 131,870 metric tons compared with 107,151 tons in June. The July figure is 62 per cent above the corresponding month last year. The increase is somewhat misleading inasmuch as it includes largely pig iron, blooms, and billets to Polish Upper Silesia for conversion into finished material to be reshipped to Germany. Exports of nails and wire products to Great Britain and Japan increased. The principal items exported in July included 39,020 tons of scrap, of which 63 per cent went to Polish Upper Siliesia, 13,901 tons of pig iron, and 11,114 tons of semifinished steel, of which 99 per cent went to Poland.

Imports in July were 190,918 metric tons compared with 141,442 tons in June and 134,947 tons in May.

British Overseas Business Shows Recovery

European Staff Special

Birmingham, England, Oct. 5.—The British board of trade's return for August shows a total export of iron and steel products including scrap amounting to 330,431 tons as compared with 314,522 tons in July and 281,954 tons in August of last year.

Imports including scrap for August totaled 121,906 tons compared with 128,486 tons in July and 84,003 tons in August of last year.

The principal exports and imports for August, 1922, August, 1923, also eight months ending August, 1923, follow:

	EXPORTS		
	Month ended Aug.,		Eight months ended August,
	1922	1923	1923
Scrap	11,971	6,554	79,801
Pig iron:			
Forge and foundry	19,003	33,299	341,168
Acid	11,640	18,408	185,623
Basic	.....	3,400	4,930
Ferroalloys	15,607	15,247	125,230
Steel ingots	52	270	1,209
Blooms, billets, slabs	364	885	12,747
Bars, rods, angles, shapes, etc.	20,235	31,583	253,044
Castings, iron	162	43	1,496
Steel girders, beams, etc.	4,585	5,907	46,428
Hoops and strips	4,834	4,663	46,102
Plates and sheets not under ⅛-inch thick	6,273	15,434	114,593
Plates and black sheets under ⅛-inch thick	13,855	22,212	184,839
Black plates	4,722	3,826	36,936
Plates and sheets, Galvanized sheets.	47,404	41,787	388,083
Tin plate	36,817	41,798	363,663
Cast tubes, pipes and fitiings	8,093	9,132	58,966
Wrought tubes, pipes and fittings	8,395	16,552	103,561
Rails for trams	112	1,221	13,043
Railway rails	22,358	16,874	175,145
Sleepers and fish-plates	10,025	4,491	51,223
Tires and axles	997	2,411	13,316
Wheels and axles	1,598	2,285	20,835
Railway material, other types	2,781	2,354	24,857
Wire	5,893	6,022	53,872
Wire manufactures.	3,817	3,250	32,435
Nails and tacks	1,042	1,253	11,549
Wood screws	182	123	2,371
Bolts and nuts	1,803	1,962	15,140
Manufactures of cast iron	1,146	1,997	15,227
Hollow ware	1,215	1,484	11,560
Other manufactures of iron and steel.	12,002	9,558	100,186
Total, including scrap	281,954	330,431	2,926,991
	IMPORTS		
Pig iron:			
Forge and foundry	4,444	4,913	37,339
Acid	155	.....	300
Basic	10,086	2,733	37,245
Ferroalloys	797	998	13,032
Steel ingots	267	1,346	7,364
Scrap	3,890	6,842	118,174
Blooms, billets, slabs:			
Iron	2,934	535	7,572
Steel	15,332	39,841	286,235
Bars, rods, angles, shapes, etc.:			
Iron	5,972	11,933	93,319
Steel	2,908	9,913	92,836
Steel:			
Wire rods	7,849	4,915	34,745
Other steel	3,368	7,036	54,425
Steel girders, beams, etc.	5,473	3,770	38,448
Hoops and strips	2,911	1,094	8,458
Plates and sheets	1,616	9,504	54,929
Cast tubes, pipes and fittings	1,964	1,678	10,473
Wrought tubes, pipes and fittings	2,023	1,337	15,330
Railway rails	1,560	841	7,181
Railway material, other types	626	684	5,274
Wire	2,941	3,786	23,713
Wire nails, including staples	3,192	3,935	35,118
Nails and tacks	171	204	2,179
Bolts and nuts	391	386	3,370
Hollow ware	1,110	452	2,977
Manufactures of iron and steel:			
Other sorts	1,122	1,009	10,199
Total, including scrap	84,003	121,906	1,012,617

German Exports for First Half of 1923

In Metric Tons of 2205 Pounds

	January	February	March	April	May	June
Pig iron, ferroalloys and scrap	39,080	46,061	30,658	39,336	45,651	45,057
Cast iron pipe	4,036	4,797	3,391	3,350	1,967	1,932
Rolls	694	1,013	650	305	351	729
Cast machine parts	148	73	94	238	104	48
Other castings	9,671	6,709	5,597	7,252	7,903	4,835
Blooms, billets, sheet bars	13,256	8,106	13,610	11,583	10,077	4,805
Bars and bands	41,556	33,240	11,568	20,401	15,215	9,575
Plates and sheets	30,745	20,834	15,663	19,017	7,284	6,630
Tinplate and galvanized sheets	1,954	2,588	2,004	1,968	697	1,151
Wire, rolled and drawn	17,567	18,996	11,052	4,180	4,868	3,514
Pipe	8,794	10,589	3,672	1,964	4,710	1,905
Rails and track fastenings	18,257	14,263	8,498	2,736	6,771	1,014
Wheels and tires	4,443	3,088	800	774	638	72
Forgings	8,661	8,734	5,822	6,575	6,963	5,326
Bridge and structural steel	3,176	2,185	1,668	596	832	599
Boilers	2,296	2,009	2,041	1,254	693	890
Anchors, hammers, etc	480	315	411	300	240	397
Agricultural implements	2,565	2,595	3,024	2,276	1,996	1,989
Tools	3,287	3,328	2,755	2,545	2,323	2,197
Screws, bolts, nuts, etc	1,487	1,074	1,055	1,183	936	925
Axles	320	187	210	185	224	184
Railway and auto springs	541	343	256	283	332	356
Wire rope	983	979	1,096	680	451	150
Other wire products	6,456	3,978	3,878	1,983	3,059	2,138
Wire nails	6,860	5,302	5,896	3,782	3,449	3,301
House hardware	2,532	2,466	2,754	2,656	2,117	2,568
Chain	639	598	523	633	676	500
Miscellaneous	6,235	5,515	5,207	5,178	5,078	4,358
Total	236,709	209,965	143,853	143,212	135,605	107,151

Northwest Business Prosperous

With Exception of Wheat, Crops Are Good—Little Business Secured from Japan as Yet, Although Considerable Is Expected, Especially in Lumber Industry—Building Continues Heavy in Seattle

Special Correspondence

SEATTLE, Oct. 13.—The Pacific Northwest is enjoying general prosperity. As a whole business conditions are more than satisfactory although in some lines a slackening of activity is noted. Crops are far better than the average and with the exception of wheat, the returns to the producer are greater than usual.

While the catastrophe in Japan has not brought any noticeable new business to this section as yet, within a few months it is expected that Oregon and Washington will have unprecedented orders for lumber and other building material. Japan, it is predicted, will be a heavy buyer and the lumber industry is anticipating prosperous times for at least two years. As logging and lumbering employ the bulk of the labor on this coast, when these industries are active every other line of business feels the effect.

As far as is known Japan has ordered no iron or steel products here since the earthquake. In the first relief supplies several hundred tons of corrugated sheeting and roofing and other supplies from local jobbing houses were rushed out on the early steamers. There has been considerable inquiry for sheets, nails, rails, pipe, and other material but no real business has resulted. Some of this inquiry has been speculative. Japan will undoubtedly have business to place within ninety days but a majority of mill representatives here believe that orders will be sent through New York direct to the plants. Local jobbing houses, whose stocks of sheets were cleaned out by the emergency, have replacement stock en route.

Chinese Market Active

Recent reports from Shanghai state that the effect of the Japanese disaster on Chinese markets was immediate. Emergency purchases by Japan stimulated the Chinese market after several months of dullness. Steel stocks in Shanghai are reported depleted and there is said to be a good demand for stocks to replace what was forwarded to Japan. Shanghai is said to be buying from several sources. Tubing and galvanized sheets are being purchased in the United States, shapes, angles and plates in Belgium, and galvanized sheets and nails in England. Steel dealers realize that in supplying Japan's needs this country will be in strong competition with Europe. Lumber exporters, however, of this section will meet less foreign competition.

Metal Trades Slack

In the metal trades of Oregon and Washington some slackening in work is noted during the last 30 days. This is evidenced by the fact that more mechanics are available than for a number of months. Activity prevailed in foundries and shops during the summer, skilled labor being at a premium. Present conditions are not alarming but simply note a falling off from the summer's peak. Surplus labor is now seeking work and the metal trades are about on a normal level. Machine shops, as a rule have more work on hand than foundries. The latter are operating to about 65 per cent of capacity while machine shops are working to 75 per cent. Some shops are operating double shifts and others have less work. On the whole the situation is about what is expected at this season.

Jobbers are entering what is expected to be an active 60 day period before the seasonal slackness prior to inventory time in December. Plates are now in improved demand as much material is required for tank and boiler repair work. Sheets, shapes, nails, building hardware, mill equipment and other lines are moving quite satisfactorily. September business showed a gain over August but neither month was up to the year's peak reached in April and May. Prices are unchanged.

Demand for bars continues fairly good although no outstanding tonnages are noted. Small lots are the rule. Business has slowed somewhat during the last month but neither the local mill nor jobbers are complaining. The price of bars at the steel mill remains stationary at 3.20c. Some foreign inquiry for bars has come from China and Japan during the month but no large orders have been closed.

One industry not on a prosperous basis is coal mining, which in this state has been hard hit by the competition of cheap fuel oil. Coal operators state that oil has replaced coal to the extent of fully 50 per cent. Two years ago the normal production of coal in Washington was 4,500,000 tons annually. At the present time production is on an annual basis of not to exceed 2,500,000 tons. Several large coal properties in this state have been permanently closed.

Actual and prospective construction work in Seattle and other northwest cities continues on a scale far greater than normal. In addition to work now under way twelve additional projects involving the expenditure of $7,000,000 have been announced for Seattle alone. These include office buildings, factories, churches, clubs and other construction of like nature. Seattle's building is expected to reach the record figure of $25,000,000 this year. Announcement has been made that $300,000 will be spent at once in altering the former Rainier brewery in Seattle for use as a packing and wood scouring plant. The Shafer office building, now under construction, will be ten stories in height instead of two as originally planned.

Contract for the construction and installation of two steel tanks of 100,000 and 50,000 gallons capacity respectively has been obtained by the Washington Engineering Sales Co. This company will furnish the steel and fabricate the material. One of these tanks is for the United States quarantine station, Port Townsend, and the smaller tank is for the Lamm Lumber Co., Modoc Point, Oregon. The same company has similar contracts in various parts of the Northwest.

The Columbia Motors Corp. has purchased the plant, inventory and other assets of the Liberty Motor Car Co., Detroit at receiver's sale for $668,000, assuming a land contract of $86,546, and merchandise credits of more than $1,000,000. Property of the Liberty Motor Car Co., includes five buildings equipped with modern machinery for the production and assembly of automobiles.

Steel Exhibition Shows Progress in 1923

(Concluded from Page 1112)

cement master die); National Automatic Tool Co., Richmond, Ind., 16-spindle drilling machine and heavy duty drilling machine with 12 spindles; Ransom Mfg. Co., Oshkosh, Wis., tool grinding machine and snagging grinding machine; and the V & O Press Co., Hudson, N. Y., a double-length slide inclinable power press.

The Laughlin-Barney exhibit consisted of a joint display by the following manufacturers; Avey Drilling Machine Co., Cincinnati, a 3-spindle drilling machine with tapping attachment, a one-spindle semi-automatic feed and one-spindle full automatic feed, together with a single-spindle machine with power feed; John Bath & Co., Inc., Worcester, Mass., full line of high speed grinding taps; Hendey Machine Co., Torrington, Conn., milling machine cutter and 14-inch by 6-foot inclosed belt motor lathe; Murchey Machine & Tool Co., Detroit, taps and dies; Ohio Machine Tool Co., Kenton, a 32-inch shaper with motor drive; Oilgear Co., Milwaukee, a 6-ton goose-neck broaching and assembling press with automatic control; Oliver Instrument Co., Adrian, Mich., a sawing, filing and lapping machine, together with two automatic drill pointers.

The McCoy-Brandt Machinery Co., Pittsburgh, displayed three lathes built by the Sidney Machine Tool Co., Sidney, O., and a 24-inch shaper by the R. A. Kelley Co., Xenia, O. A full line of hammers, together with a ball-bearing drill press was shown by the High Speed Hammer Co., Rochester, N. Y., The Warner & Swasey Co., Cleveland, had a hollow hexagon turret lathe in operation, turning out actual work for the buyer of the machine. The Armstrong-Blum Mfg. Co., Chicago, demonstrated hack saw machines, including an automatic high speed saw, together with metal band saw, punching, shearing and bending machines. Metal sawing machines also were shown by the Racine Tool & Machine Co., and the Peerless Machine Co., Racine, Wis. The Hunter Saw & Machine Co., Pittsburgh, displayed its sharpening and beveling machine, together with saws, grinders, knives, etc. Flexible shaft equipment and portable tools for drop forging work were shown by the R. G. Haskins Co., Chicago.

The Pangborn Corp., Hagerstown, Md., conducted an extensive exhibition of barrel, cabinet and rotary table sand blast equipment in operation. Work produced on the machines manufactured by the National Machinery Co., Tiffin, O., was displayed, and photographs, blue prints, etc., of the work produced by its billet shearing machine was shown by Henry Pels & Co., Inc., New York, in conjunction with its Pittsburgh representative, William K. Stamets.

Officers of National Tool Builders Association

Through an inexcusable error in make-up, the list of new officers of the National Machine Tool Builders association appeared in last week's issue on the page containing an account of the convention of the American Society for Steel Treating. The list of officers of the latter organization is published on page 1114 of this issue with the account of the last days of the Pittsburgh meeting. The new officers of the National Tool Builders association are as follows: president, R. E. Flanders, Jones & Lamson Machine Co., Springfield, Vt.; vice presidents, O. B. Iles, International Machine Tool Co., Indianapolis; and Norman D. McLeod, Abrasive Machine Tool Co., E. Providence, R. I.; and treasurer, H. M. Lucas, Lucas Machine Tool Co., Cleveland. The new directors (one-year term) are H. P. Dix, Wilmarth & Morman Co., Grand Rapids, Mich; (three-year terms), J. G. Benedict, Landis Machine Co., Waynesboro, Pa.; H. M. Lucas, Lucas Machine Co., Cleveland; and R. E. Flanders, Jones & Lamson Machine Co., Springfield, Vt.

Buys Rolling Mill

Chicago, Oct. 16.—The 12-inch bar mill and the 16-inch sheet mill, formerly in the plant of the Joliet Rolling Mill Co., Joliet, Ill., have been purchased by the American Metal Products Co., Milwaukee, and will be housed in a 70 x 120-foot addition which is to be ready for occupancy about Jan. 1. The company manufactures a bronze alloy which is acid resisting and also has properties making it useful as a bearing metal. Heating furnaces and a sheet shear will also be installed.

Obituaries

Rutherford B. Burgher, aged 65, well known in the steel industry in the upper Ohio valley is dead at his home in East Liverpool, O. For the past 20 years he had been identified with the steel industry in Ohio and Pennsylvania. He founded the Kidd Bros. Steel Co., Aliquippa, Pa., and later came to East Liverpool, where he organized the National Drawn Steel Co. of which he was general manager for about five years.

States Fight Base

With 19 Organizing to Oppose Pittsburgh Basing Practice

Chicago, Oct. 16.—A new organization is being effected here this week by opponents of the Pittsburgh basing point plan, under the name of "The Associated States Opposing Pittsburgh Plus". It is an outgrowth of the creation of a joint commission by Illinois, Wisconsin, Iowa and Minnesota, with appropriations aggregating $55,000 to finance the fight. An invitation to other states to join the movement resulted in the enlistment of governors or attorneys general from fifteen other states.

W. E. McCollum, secretary of the Western Association of Rolled Steel Consumers, the organization which started the campaign against the practice of basing steel prices on Pittsburgh, has been made assistant secretary of the new organization, with offices at 1305 City Hall Square building, Chicago.

A request by the four-state commission that taking rebuttal testimony be deferred to allow further research into the economic status of the case has resulted in a postponement of the hearings from Aug. 6 to Dec. 10. The commission has retained the services of Dr. John R. Commins, professor of economics at the University of Wisconsin. He will be assisted by Frank A. Fetter, professor of economics at Princeton university, and Dr. W. Z. Rilley, professor of economics at Harvard university. These men will testify in the rebuttal in an effort to combat the theory of the defense that the Pittsburgh base is the result of the operation of the law of supply and demand and that Pittsburgh as the point of surplus production of rolled steel naturally dominates the market.

In addition to the state commissions in Illinois, Iowa, Wisconsin and Minnesota, the governors and attorneys general of the following states are directors at large of the new association: Florida, Georgia, Idaho, South Dakota, Indiana, Kansas, Kentucky, Michigan, Missouri, Montana, North Dakota, Nebraska, Nevada, New Mexico, Oklahoma.

Federal Judge Dickinson of Philadelphia, has approved an agreement by which the Commercial Truck Co., and the Commercial Truck Service Co. are removed from the control of the R. L. Dollings Co. of Pennsylvania in return for the payment of about $350,000 in cash and real estate.

Market Limited to Small Sales

Machinery Orders Continue at About Same Rate as in September—Ford Motor Co. Is Heavy Buyer—Interest Centers at Machinery Exhibit at Steel Treaters Convention—Railroad Buying Light

SALES of machine tools and shop equipment during the first half of October have been at a rate slightly in excess of that realized during the month of September. However, in the main the business closed has been confined to small installations, large orders being rather scarce. Perhaps the largest buyer in this period was the Ford Motor Co., Detroit, which closed on 100 production lathes and a large number of boring mills in the New York district. Sales are scattered over a list of diversified industries, and in the main are confined to machines for increasing production or for replacement purposes. Inquiries have increased during the past two weeks, giving the market a better tone. The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has reported the receipt of orders from Japan for electrical equipment totaling over $1,000,000.

Railroad buying has been rather light during the week, few lists being closed. The Pennsylvania has closed on recent inquiries for tools and equipment for shops in the Pittsburgh district, and the purchase of several tools by the Santa Fe is reported. The Pittsburgh & Lake Erie has not closed on its recent inquiry and the Norfolk & Western has issued a list for approximately 25 tools.

Interest during the week in the Pittsburgh market has centered around the exhibition held in connection with the annual meeting of the American Society for Steel Treating. Although sales at this exhibition were rather limited, some good inquiries developed.

Other industrial buyers during the week include the Witherow Steel Co., Pittsburgh, the Pettibone-Milliken Co., Chicago, and the Pelton Water Wheel Co., San Francisco. Business in the second hand market is slack. Auction sales of good used machinery continue and it is reported that other plants having considerable machinery will be sold.

Inquiries Better for New and Used Machinery

NEW YORK, Oct. 16.—Business in machine tools during the past week has been dull. Orders have been scattered, and while substantial business is pending, including export inquiries previously noted, there is little outstanding in the way of fresh demand. The intervention of the holiday, Oct. 12, undoubtedly contributed in a measure to the dullness of the past week; nevertheless the immediate outlook is not encouraging.

Considering the first half of October, as a whole, general buying in this district has shown little improvement, although inquiries are in slightly better volume. The Ford Motor Co. was perhaps the outstanding buyer, closing on more than 100 production lathes and also a large number of boring mills to builders in the eastern district. The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has reported the sale of electrical apparatus to be used in reconstruction work in Japan totaling well over $1,000,000. Other orders in the course of negotiation will bring this total amount to approximately $2,000,000.

Featuring the crane market is a list of 14 electric overhead cranes, ranging from three to 25 tons capacity, for the new Philadelphia plant of the General Electric Co. Orders have been scattered.

Calendar and Selected News of Plant Liquidations, Wholesale Offerings, Auctions of Used and New Equipment, etc., page 96; Classified Machinery Section.

No material improvement has developed in the eastern foundry equipment market. Inquiry is slightly better, but orders, for the most part, are coming through slowly. Included in recent orders is an electric furnace for the plant of the International Nickel Co., Huntington, W. Va., this business going to the Pittsburgh Electric Furnace Corp., Pittsburgh. The Columbia Machine Works & Malleable Iron Co. Brooklyn, has just closed on 600 tons of steel for a building to replace the portion of its plant badly damaged by fire several weeks ago. It is understood, however, that the major portion of the new structure will be devoted to a machine shop, and that, therefore, little foundry equipment will be required. The Richardson & Boynton Co., Dover, N. J., is inquiring for four electric hoists. The Boynton Furnace Co., Jersey City, N. J., recently noted as contemplating an extension, is reported to have decided to postpone this project until next year. The Frick Co., Waynesboro, Pa., has recently purchased two 5-ton jib cranes from the Whiting Corp. Some sizable business, recently reported as pending still is being figured by two large companies identified with the railroad industry. As a whole, current demand is made up almost entirely of equipment for replacement purposes. However, a seller of molding equipment in this district reports that his plant is still operating on a day and night shift, but this situation appears exceptional among the plants of the great majority of equipment sellers. No immediate changes in prices of foundry equipment are expected.

Volume of Sales Fair

CLEVELAND, Oct. 16.—Although large sales of machine tools and shop equipment in this territory are almost entirely lacking, the volume of small orders being closed presents a fair sized total. However, the business realized during the first half of October has not been up to expectations which were expressed during

the slack summer period. At present, dealers feel that the market will not show any marked increase during the rest of the year, but that sales will continue at about the present rate, with orders confined to small installations. Machinery being sold at the present time is chiefly for the purpose of increasing production with a saving of labor or replacement of worn out tools, little increase in capacity being noted. Inquiries have been showing signs of improvement during the past two weeks.

Much of the present buying is being done by the automobile and allied industries, although several dealers report that sales are scattered over a variety of industries. During the week 16 turret lathes were placed with a local manufacturer by the American Bosch Magneto Co. Another dealer reports the sale of a keyseater, a surfacing machine and a 4-spindle drill press to local manufacturers. Little railroad buying is reported in this market, but the Norfolk & Western has issued an inquiry for 23 tools.

Business in woodworking machinery is showing a better tone than during the summer. Considerable used machinery is being purchased by this trade. The second hand machinery has been a little quiet during the week as far as actual sales are concerned. However, inquiries are keeping up at a fair rate and prospects for better business in this line are bright. Several dealers have been purchasing a number of machines during the past few weeks.

Some New Orders Appear

BOSTON, Oct. 16.—Machine tool dealers continue to find business dull. Used tools have been in slightly better demand. In Connecticut where some large stocks have recently come into the market, dealers report a fair trade to points outside of New England. In Boston between 15 and 20 fair sized used tools were sold during the week. Among New England manufacturers the tone of the market is more cheerful as a general thing.

New orders, after the decided drop in September now appear to be coming in at a steady rate which, while considerably lower than earlier in the year, nevertheless, is such as to enable most plants to operate around 50 per cent of capacity. The personnel of most plants has been reduced to meet the new lower levels and it appears now as if a steady run at the present rate would continue. One manufacturer maintaining offices throughout the country finds that the western territory is buying along more generous lines than the eastern at the present time. This manufacturer reports sales in Michigan and Ohio during the past week as nearly double those of the week before. Prices of new tools hold remarkably firm throughout the country. Inquiry in the East includes several lists from railroads and two or three attractive lots from manufacturers. A Connecticut manufacturer is asking for five tools for a plant addition.

Exhibit Holds Attention

PITTSBURGH, Oct. 16.—Attention in machine tool circles this past week was largely directed to the exhibition at Motor Square Garden of the American Society for Steel Treating at which machine tool builders were well represented by their local dealers, Motch & Merryweather, Laughlin-Barney and McCoy-Brandt Machinery companies. Visitors to the city have taken advantage of the opportunity to call upon other dealers maintaining display floors, not represented at the show. Sales have been somewhat limited but a pleasing number of inquiries have been developed.

The feature of the week's machine tool business is the placing of formal orders by the Pennsylvania railroad on its recent lists for nearby shops, including Pitcairn. The Reliance Machinery Sales Co. was the successful bidder on three 20-inch and one each 18 and 24-inch lathes. Some heavy-duty upright drills and other equipment likewise were placed. The Pittsburgh & Lake Erie railroad, however, has not closed on its inquiry for a 600-ton wheel press and a shaper, nor has the Westinghouse Electric & Mfg. Co. started its buying program on its fourth quarter list of 60 items, both inquiries being referred to last week.

Several dealers have a large number of inquiries before them and a fair percentage of these involving single items turn into orders from week to week. The Witherow Steel Co. bought a straightening machine. A local steel company purchased from a display at the Steel Treaters' show of the Peerless Machine Co., through Somers, Fitler & Todd Co., a machine for cutting up 36-inch round rolls. This dealer also sold a 5-foot radial drill from its floor recently. Sellers of woodworking machinery report that October is much better than September from a sales standpoint and dealers disposing of used machine tool equipment likewise report an expedited movement. One interest successfully disposed of two small power presses in addition to four heavy duty drills. Another sold a milling machine and a 16-inch shaper, together with a 36-inch lathe with 29½-foot bed, to three customers. Other buyers are inspecting horizontal boring, drilling and milling machines and a long-distance telephone inquiry has been received for a double-end punch and shear. A local machine shop closed on a second-hand air compressor.

The crane market is exceedingly dull, no awards being noted since the Griffin Mfg. Co., Erie, Pa., closed on three cranes with an Erie builder. No new crane inquiries are out although one or two hoist propositions are up for attention.

Business Is Spotty

CHICAGO, Oct. 16.—Business in machine tools continues spotty, with some dealers reporting slight improvement and others unable to see any deviation from the low level of activity that has prevailed. The Pettibone-Mulli-

Crane Awards and Inquiries of the Week

Orders Placed

One 10-ton and two 5-ton cranes for the Griffin Mfg. Co., Erie, Pa., to the Erie Steel Construction Co., Erie, Pa.

One 10-ton overhead traveling crane for the Pacific Pump Co., Los Angeles, to the Shepard Electric Crane & Hoist Co.

A tramrail system to be built by the Cleveland Crane & Engineering Co. for the Los Angeles Pressed Brick Co., Los Angeles, to Geo. B. Morris Co., Los Angeles.

One 10-ton electric crane, 48-foot 6-inch span, for the Raritan Foundry Co., Raritan, N. J., to the Chesapeake Iron Works.

One 5-ton electric crane, 35-foot span, for the Pottstown Boiler & Tank Works, Pottstown, Pa., to Alfred Box & Co.

One 40-ton locomotive crane for the McClintic-Marshall Co., Pittsburgh, to Industrial Works.

One 10-ton electric crane, 59-foot span, for the Pelton Water Wheel Co., to an eastern builder.

One used 15-ton Orten & Steinbrenner Co. locomotive crane, 54-foot boom, for the San Antonio & Arkansas Pass railroad, for shipment to Yoakum, Tex., to Philip T. King, 30 Church street, New York.

Orders Pending

One 40-ton, one 15-ton and two 5-ton overhead traveling cranes for the Southern California Edison Co. Bids opened Oct. 15.

Five 5-ton overhead traveling cranes for the United States Steel Products Co., Los Angeles, bids being received.

Two 10-ton overhead traveling cranes for the Emsco Tool Co., Los Angeles.

Fourteen electric overhead cranes, including two laternates, for the proposed Philadelphia plant of the General Electric Co., the inquiry issued through Schenectady, N. Y.

One 5-ton overhead crane for the Erie railroad, bids asked.

ken Co., Chicago, has purchased a multiple spindle press, a broaching machine, a heading and forging machine and is reported about to close for a die-sinking machine. More tools may be bought in December by this company. Carr Bros., Inc., 65 Broadway, New York, have out a list seeking to purchase, second-hand, 44 machine tools, 21 wood-working tools and four pneumatic hoists.

Fair Sales Reported

MILWAUKEE, Oct. 16.—Fair sales are being made by local manufacturers of metalworking equipment, business having become more active after the pronounced dullness of the summer. Automobile shops are still the best buyers and have recently increased their orders, although in no case have any large lots been placed in this market. Railroad buying remains disappointing with but few orders received of late. General industrial demand is only fair and confined largely to replacements. There is a lot of used machinery on the market which buyers say they can get at such a substantial reduction compared with new, usefulness being about equal, that they prefer the second-hand.

New Business Light

LOS ANGELES, Cal., Oct. 13.—While activity in the machine tool market here is greater than is the case in the San Francisco district the trade has felt the effect of the curtailing of operations in the oilfields throughout the state with the result that little new business is coming in from this source.

The majority of the sales and inquiries continue to be confined to the installation of single tools and for the most part relatively small tools are involved. The largest list reported closed here during the past month consisted of a lathe, a shaper, a radial drill and a drill press for shipment to Esperanza, Mexico.

The Pelton Water Wheel Co., San Francisco, purchased a 10-foot radial drill. The Emsco Oil Tool Co., Los Angeles, is in the market for a large list of second hand tools and equipment. The sale of one 1500 and one 3400-pound steam hammer to the Santa Fe is reported.

The crane market is fairly active here and several good inquiries are before the trade for figures now, largest among which is one 40-ton, one 15-ton and two 5-ton overhead traveling cranes for the Southern California Edison Co., and five 5-ton overhead traveling cranes for the Los Angeles warehouse of the United States Steel Products Co.

Business Slightly Better

TORONTO, Ont., Oct. 15.—While the demand for machinery and machine tools is not as active as dealers and builders expected for this season, sales continually are being made and orders closed during the past week were somewhat better than those for the previous week. Large lists still are absent from the market, but inquiry is reported from buying interests who have factories and plants of one kind or another under way or about to be started, and buying on their account is beginning to pick up. The Canadian railways are showing interest in tools for their various shops, but buying chiefly is for replacement purposes.

The automobile industry continually is entering the market for two or three tools at a time, and at the same time some concerns have new plants and additions under way for which some rather extensive equipment buying is expected. Small tools are moving freely with buyers showing interest in various lines both for immediate use and for requirements covering the remainder of the year. Machinery and tool prices are holding firm but unchanged and it is stated that for some time past there has been little or no shading or cutting in order to close business. However, it might be pointed out that the larger and more expensive tools are moving more slowly than those of the cheaper lines.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

HARTFORD, CONN.—Skayef Ball Bearing Co. has awarded contracts for building a 1-story, brick, 50 x 75-foot factory addition.

HARTFORD, CONN.—The Fuller-Gates Co., Inc., has been incorporated for $50,000 by Sumner E. Fuller, Suffield, Conn., Fred P. and P. R. Gates, to make electrical wiring devices.

SOUTHINGTON, CONN.—The Aetna Steel & Iron Co., Inc., has been incorporated for $170,000 by Seth L. Martin, Brookline, Mass., Clinton E. Hobbs, Boston, and Jacob Stephans, Pawtucket, R. I.

CHICAGO—Lake Shore Steel & Machinery Co., 168 North Michigan boulevard, was incorporated for $10,000 by W. J. Fried, Ruth F. Lindblade and A. A. Klapman to manufacture and deal in steel machinist supplies, etc.

CHICAGO—Sterling Utilities Corp., 64 East Van Buren street, was incorporated for $10,000 by R. S. Montgomery, R. E. Scott and J. A. Siebert to manufacture and deal in oil burners, gas burners and general utilities.

CHICAGO—McFarland Chicago Co., 2618 South Michigan avenue, was incorporated for $5000 by G. G. Buxton, E. L. T. Dill and R. E. Leopold to manufacture and sell, buy and deal in automobiles and motor vehicles etc.

CHICAGO—Austin Screen Co., 4836 West Division street, was incorporated for $24,000 by Herman Richter, Charles W. Zimmer and Charles Rioger to manufacture and deal in window screens, door screens, shades, etc. Correspondent is John W. Eich, 506, 140 North Dearborn street.

CHICAGO—Andrews Machine Works, Inc., 2450 West Forty-eighth place, was incorporated with $36,000 capital and 240 shares no par value stock by W. W. Haley, R. G. Crandall and E. R. Johnston, to manufacture and deal in all kinds of machinery, machinery parts, accessories, etc. Newman, Poppenhuser Stern & Johnston, 11 South La Salle street is correspondent.

FREEPORT, ILL.—Stephens Motor Co., Inc., was incorporated for $2,000,000 by H. S. Johnson and R. W. Lea to manufacture and deal in motor cars, vehicles, trucks, tractors, etc. Moline Plow Co., Moline, Ill. is correspondent.

KOKOMO, IND.—F. W. Mackey & Co. has been incorporated for $100,000 by Fred W. Mackey and Joseph Nielander of Kokomo, Ind., and Theodore Nielander, Ft. Thomas, Ky., to manufacture and sell wrenches.

LA PORTE, IND.—The Bastian-Morely Co., manufacturer of boilers, heaters, etc., will construct a 1-story addition, 54 x 200 feet, at a cost of approximately $75,000 including equipment.

PORTLAND, ME.—The Capco Corp. has been incorporated for $25,000 by Clifford A. Plummer, M. E. Cook and Frank N. H. Nixon to manufacture shock absorbers.

BROCKTON, MASS.—The Thompson Found-

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	4.30c
New York	3.54c
Philadelphia	3.55c
Pittsburgh	3.15c
San Francisco	3.75c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	4.40c
New York	3.64c
Philadelphia	3.65c
Pittsburgh	3.25c
San Francisco	3.60c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	4.45c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
Pittsburgh	3.25c
San Francisco	3.75c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.45c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.75c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.25c
Seattle	5.00c
St. Louis	4.45c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.45c
Buffalo	5.25c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.15c
Los Angeles	6.50c
New York	4.90c to 5.15c
Philadelphia	5.15c
San Francisco	5.80c
Seattle	6.00c
St. Louis	5.30c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.60c
Buffalo	6.35c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.60c to 5.80c
Detroit	6.30c
Los Angeles	7.30c
New York	5.95c to 6.15c
Philadelphia	6.25c
San Francisco	6.50c
Seattle	7.00c
St. Louis	6.45c

BANDS

Boston	4.315c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	5.20c
New York	4.39c
Philadelphia	4.35c
Pittsburgh	3.95c
San Francisco	4.50c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Pittsburgh	3.95c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.70c
Buffalo (shapes)	5.20c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angles (rounds)	5.90c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
Pittsburgh	4.25c
San Francisco (rounds)	5.75c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.55c

ry & Machine Co. has been incorporated for $100,000 by Elliott D. Thompson, Abington, Mass., James A. Munroe and Leverett N. Freeman, both of Newton, Mass.

CHELSEA, MASS.—The core room of the Griffin Wheel Co. was damaged by fire recently with a loss of approximately $25,000.

WOLLASTON, MASS.—The Boston Gear Works, Haywood street, plans installation of equipment in new 2-story addition, 85 x 100 feet, costing about $50,000.

WORCESTER, MASS.—The Peterson Metal Action Co. has been incorporated with $50,000 capital and 500 shares no par value stock by Claus E. Peterson, Mense L. Howard and Siri E. Peterson.

BALTIMORE, MD.—The Saboco Pump Co., has been incorporated with $250,000 capital to establish a plant for the manufacture of pumps and kindred products. Charles R. Samma is incorporator.

CAMDEN, N. J.—Differential Transmission Co., 424 Market street, was incorporated for $200,000 to manufacture transmissions.

NEWARK, N. J.—Automatic Tool Co., 31 Clinton street, was incorporated for $100,000 to manufacture tools.

NEWARK, N. J.—Percoplate Boiler Sales Co., 111 Gothart street, was incorporated for $100,000 to manufacture boilers, especially percoplate boilers.

NEWARK, N. J.—The Artesian Well-Engineering Co., Inc., 20 Branford place, was incorporated for $100,000 to manufacture and deal in machinery.

NEWARK, N. J.—A machine repair shop will be installed in a garage to be erected by the Yellow Cab Co. The building will be 165 x200 feet and will cost approximately 150,000.

BUFFALO, N. Y.—Thermo Automatic Oil Burner Corp. was incorporated for $200,000 by W. L. Higgins, 20 West Utica street, to manufacture oil burners.

NEW YORK—Property has been purchased by the Consolidated Gas Co., 130 East Fifteenth street, for the establishment of a gas manufacturing plant estimated to cost approximately $1,500,000.

NEW YORK—A plant will be established soon by the New Matic Machine Corp., recently incorporated for $50,000 to manufacture machinery. Representative is Levinson, Niner & Levinson, 13 Astor place.

NEW YORK—The American Hoist & Derrick Co., 50 Church street, bought part of the plant of the Terry Mfg. Co., 15 Exchange place, Jersey City, N. J., and will use it for an eastern plant to manufacture derricks, cranes and other hoisting machinery.

NIAGARA FALLS, N. Y.—Plans to rebuild the plant recently damaged by fire are being made by S. M. Ryder Mfg. Co., manufacturer of capping machinery, etc. S. M. Ryder is president.

ROCHESTER—Universal Tool Corp. was incorporated with $25,000 capital and 500 shares no par value stock by C. A. Vidinghoff, A. R. Peterson.

WATERVLIET, N. Y.—Plans are being prepared by the John C. Tilly Ladder Co., for the erection of a new plant for the manufacture of metal reinforced ladders and kindred products. William E. Clark, Troy, N. Y., is architect.

WATERVILLE, N. C.—Plans are being completed for the erection of a 150,000 horsepower hydroelectric plant on the great Pigeon river, the dam to be 150 feet high.

CANTON, O.—Erection of an addition to the plant of the Arctic Ice Machine Co. costing approximately $25,000 will be started immediately.

DAYTON, O.—The Dayton Fire Door Co. was incorporated for $15,000 by Walter F. Geis, Herman J. Brown, Agnes Geis, Anna Brown and Horace J. Hoesch.

ELYRIA, O.—The L. R. Universal Crane Co. was incorporated for $500 by David L. Jonson and M. C. Byrnes.

HAMILTON, O.—To manufacture machinery, tools, dies, jigs, etc., the Lion Mfg. Co., Fifth and Heaton streets, was incorporated with $20,000 capital.

IRONTON, O—A roundhouse and machine shop is to be constructed here for the Chesapeake & Ohio railroad.

SPRINGFIELD, O.—Safety Emery Wheel Co. plans a $1000 addition to its plant.

YOUNGSTOWN—Fire damaged the Re-

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

public Iron & Steel Co. recently with a loss of $40,000, chiefly due to damage to machinery in its shop department.

CATASAUQUA, PA.—Work has been started on the erection of plant additions by the Bryden Neverslip Co. The equipment contracts are now being placed.

HARRISBURG, PA.—About five acres have been purchased by the Harrisburg Pipe & Pipe Bending Co., to be used for future expansion.

KANE, PA.—E. E. Austin & Son, Erie, Pa., has the contract for a 2-story addition to the plant of the Kane Mfg. Co., this city, manufacturer of wire goods.

KIMBERTON, PA.—A foundry and machine shop will be built here by Phoenixville, Spring City and Kimberton parties.

LANCASTER, PA.—Plans are being drawn for a 1-story, 40 x 90-foot foundry for L. Schutte, 650 East Marion street, of brick and steel construction.

LANCASTER, PA.—The Liberty Can & Sign Co., North Water street, plans the construction of a $75,000 4-story factory on a site recently purchased.

NEW BRIGHTON, PA.—The Damascus Steel Casting Co. was incorporated for $300,000 by Charles Capper, Wilkinsburg, Charles H. Capper, New Brighton, and Florence C. Peterson, Wilkinsburg, to manufacture and sell iron and steel and castings.

PALMERTON, PA.—Approximately $300,000 will be spent on a new high school here to be equipped with manual training facilities. The New Jersey Zinc Co. has contributed $150,000 to the project.

PAOLI, PA.—A 2-story service building, including machine shop will be erected here by Walter T. Mathews.

PHILADELPHIA—Bristol Steel Corp. was incorporated for $50,000 to manufacture fabricated metal sheeting.

PHILADELPHIA—Fire damaged the Perseverance Iron Foundry, Inc., 822 Latonia street, recently with damage of about $2500. P. Lanning, Overbrook, Pa., is owner.

PHILADELPHIA—Bids have been received recently by Clarende Wunder, architect, for the erection of a factory building for Frank Shellenberger Co.

PHILADELPHIA—General contract for the erection of a $75,000 plant addition has been awarded by the Olney Foundry Co., to the Northern Construction Co.

PHILADELPHIA—General contract for the erection of a $200,000 assembly plant for George W. Smith & Co., Inc., has been placed with the John M. Gill Construction Co.

PHILADELPHIA—A $23,000 plant addition will be erected by the Certainteed Products Corp. Robert S. Tillotson, Swarthmore, has been awarded the general contract.

PHILADELPHIA—General contract for the erection of a $50,000 factory building for the R. M. Hartnett Co., has been awarded to the John N. Gill Construction Co.

PHILADELPHIA—Machine tool and other manual training equipment will be needed in the new $1,000,000 high school to be constructed at Twenty-third and Federal streets.

PHILADELPHIA—Austin Co. has the contract for the erection of a $23,000 extension to the plant of Remington & Sherman Co., 636 Richmond street, manufacturer of safes, vaults, etc.

PITTSBURGH—Acme Steel Construction Co. is to be organized by George L. Redpath, Michael Pfaff and J. Frank Peffer to engage in the manufacture of iron or steel or any other metal or articles thereof.

QUARRYVILLE, PA.—The plant of the Quarryville Body Building Co., maker of automobile bodies, was damaged by fire recently with estimated loss of $22,000.

PROVIDENCE, R. I.—Goodwin & Gregory, press piercers, are to build a 1-story brick, 50 x 120-foot factory.

PROVIDENCE, R. I.—The Finishing Machines, Inc., has been incorporated for $50,000 by John S. Murdock, John A. Tillinghast and John C. Going, to build machinery.

CHARLESTON, S. C.—Contract for the erection of a 650-foot concrete pier has been awarded by the Port Utilities commission to the Raymond Concrete Pile Co., New York. The pier will cost $542,894.

Business Changes

THE Lipman Refrigerator Car & Mfg. Co., Beloit, Wis., a Delaware corporation, has had its name changed to the Lipman Refrigerator Co. Carl Lipman, president and general manager, recently sold a large interest of the company to capital in Rockford, Ill.

* * *

Osco Mfg. Co., Chicago, has been changed to the Osco Mfg. & Rivet Co., and has increased its stock from $25,000 to $35,000.

* * *

The Straub-Atkinson Coal & Coke Co., third floor Union arcade, Pittsburgh, has changed its name to the Arch H. Straub Coal & Coke Co.

* * *

Norris Mfg. Co., Columbus, O., manufacturer of vending machines, plans to move from its present location at 1424 Cherry street, to a new building.

* * *

The name of the Republic Radiator Corp., Utica, N. Y., has been changed to the Lincoln Radiator Corp. No change is made in the officers or personnel of the organization.

UNION, S. C.—Construction will be started shortly on the plant of the Union Iron Works, recently damaged by fire with loss of about $20,000. J. M. Morse heads the company.

MEMPHIS, TENN.—The R. E. Smith Electric Machine Co. was incorporated for $20,000 by P. D. Rogers, W. S. Counsell, B. H. Johnson and A. L. Collins.

NASHVILLE, TENN.—The M. B. Automotive Corp. recently incorporated is reported to have obtained factory buildings at Jacksonville, near here, for the establishment of a plant.

BRANDY, VA.—The Brandy Mining Co. will develop 75 acres of copper deposits and will build necessary buildings and instal machinery. The main office is in McLean, Va.

DANVILLE, VA.—The Smith Cutlery Co. is in the market for equipment and machinery with which to equip the plant planned for the manufacture of cutlery. H. A. W. Smith is secretary.

HALLWOOD, VA.—J. W. Taylor has purchased the store property of Hitchens Bros. and will establish a machine shop and garage there.

PORTSMOUTH, VA.—Plans are being prepared for a $50,000 plant for the Southern Brake Shoe Works, Inc., now operating in the local plant of the Southern Brass Works.

PORTSMOUTH, VA.—The Downie Co. has been incorporated with $200,000 capital to establish a plant near here to manufacture motorized cultivator plow machines. C. E. Downie is president.

SALEM, VA.—Installation of electric power equipment and mechanical equipment is being planned for the Crown Coal Co. Hoisting and other machinery will also be required.

SOUTH NORFOLK, VA.—Virginia Fuel Corp., 930 High street, Portsmouth, Va., has been organized to manufacture processed coal or briquets, with F. W. Beazley, president; L. Harper, secretary, and S. W. Williamson, manager.

ELK GARDEN, W. VA.—Deep Run Big Vein Coal Co., is planning to expend approximately $300,000 for development of 2500 acres of coal land, including the construction of tipple, 100-foot incline and power plant, machine shops, miners' houses, etc. Benjamin Robinson, Frostburg, Md., is the engineer in charge.

FOLLANSBEE, W. VA.—The Jefferson Glass Co. plans to expand its plant in this city. Equipment for the new departments has been purchased.

HINTON, W. VA.—Baker Mfg. Co. was incorporated for $25,000 by Frank Baker, W. A. Charlton, H. A. Shumate, W. H. Gwinn, J. O. Knapp and R. F. Dunlap, to manufacture, buy and sell machinery.

LOGAN, W. VA.—The Logan Cut Out Switch Mfg. Co. has been incorporated with $100,000 capital to manufacture a patented switch being produced at the present time by the West Virginia Grinding & Machine Shops, Huntington, W. Va. Construction of a plant is planned.

NEW MARTINSVILLE, W. VA.—The Lanam Foundry Co. recently began to rebuild its plant damaged by fire.

APPLETON, WIS.—Articles of incorporation have been filed by the General Distributing Co., to deal in shop, factory and mill machinery and equipment by F. A. Daneiko and D. J. Jacobsen.

APPLETON, WIS.—The Kurz Motor Car Co. has purchased the Christensen building at College avenue and the Soo Line depot and will remodel it for a garage, adding an 80-foot annex for machine and repair work.

APPLETON, WIS.—A new plant costing $40,000 will be built by the Helm Cut Stone Co. The main building will be 50x100 feet. New machinery will be installed. Several hand cranes, up to 5 tons capacity, a large carborundum saw and other items are included in the list.

BIRON, WIS.—Consolidated Water Power Paper Co. will construct a 2-story, 60x70 foot, $25,000 machine shop and storeroom. Owner desires quotations on centrifugal pumps.

COBB, WIS.—H. J. Selmer Co., Green Bay, Wis., has taken the general contract to build a $100,000 cannning factory here for the Cobb Canning Co. Machinery will not be purchased until after Jan. 1. Two 100-horsepower boilers and an 80-foot stack are among the specifications.

EAU CLAIRE, WIS.—The Green Bay Barker Co., Green Bay, Wis., has been awarded the contract to furnish four large pulp grinders for a $400,000 improvement project of the Dells Paper & Pulp Co., Eau

Mr. Executive

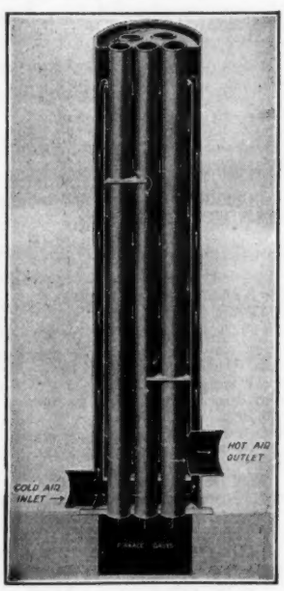
ASK -your metallurgist

what your flue gas temperatures are. If they exceed 1000° F., then you are paying for fuel to heat outdoors.

-your auditor

what your yearly fuel bill is *and then ask us* to *show* you how the heat which is now being wasted in your furnace stacks and vents, can be put back into your furnace, *reducing your fuel cost 15 to 30 per cent.*

You may have the same labor and raw material costs as your competitor; your plant may be equally well managed; *but*—if his fuel cost per ton of finished product is less than yours he has an advantage on competitive business. It doesn't matter whether your furnaces are large or small, old or new, you can greatly reduce your fuel cost by equipping your furnaces with *Calco Recuperators.*



Calco Recuperator

Calco Recuperators utilize the waste gases that are leaving the furnaces at high temperature, to heat the air that is burnt with the fuel—and thereby reduce the amount of fuel that is necessary to maintain the proper furnace temperature!

CALORIZING—
What it does—

Calorizing drives aluminum into metal surfaces so as to form an aluminum alloy. In use, this alloy develops an aluminum oxide on the surface which immediately renders the tube resistant to the action of oxidizing, reducing, or sulphur gases.

Calorized tubes are good for application in temperatures up to 1650°F. (bright orange heat), which means that the heating gases may be well in excess of 2000°F.

The coupon brings a straight forward and accurate analysis of heating costs which will surprise you.

THE CALORIZING COMPANY

General Offices: Oliver Bldg., Pittsburgh, Pa.

50 Church St.
New York, N. Y.

224 S. Michigan Ave.
Chicago, Ill.

424 West Bldg.
Houston, Tex.

2-220 General Motors Bldg.
Detroit, Mich.

720 Commerce Bldg.
Kansas City, Mo.

——————Clip this coupon——————

Information which will enable me to determine the fuel I can save with a Calco Recuperator interests me.

Name:_____ Position:_____

Company Name:_____

Address:_____

Claire, Wis. A new hydroelectric dam is being built which calls for thirteen steel tainter gates, contracts for which will be let shortly.

FOND DU LAC, WIS.—J. F. Hogensee, secretary of the board of public works, is taking bids until Oct. 10 for a sewage ejector and other machinery for an addition to the pumping plant of the municipal sewage disposal system.

GREEN BAY, WIS.—The Mid-West Automotive Accessories Corp., was incorporated for $50,000 to manufacture automobile parts, specialties and appurtenances by A. R. Klug, A. A. Brazeau and Ralph W. Davis.

HARTFORD, WIS.—Additions costing about $50,000 will be made by W. B. Place & Co., local tanners, to handle increasing business. Additional power plant and factory equipment will be needed.

HURLEY, WIS.—John Emunson, city clerk, is taking bids until Oct. 23 for the construction of a water purification plant and pump station, including intake, discharge main, pump equipment, chemical apparatus and repairs on

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron. $6.45
Mesabi bessemer, 55 per cent iron. 6.20
Old Range nonbessemer, 51½ per cent iron. 5.70
Mesabi nonbessemer, 51½ per cent iron. 5.55

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent. 10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent. 13.25 to 16.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent. 9.00 to 10.50
Algerian low phosphorus, 52 to 54 per cent. 10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent. nominal
Swedish foundry or basic, 66 to 68 per cent. 10.50 to 10.75
Spanish foundry or basic, 50 to 54 per cent. 8.00 to 9.50

Manganese Ore

Prices do not include duty at rate 1 cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent nominal
Indian, minimum 47 per cent ..... 40 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent ..... 41 to 42 cents c.i.f. tidewater

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per net ton. $20.00 to $23.50
Washed gravel, imported, duty paid eastern tidewater, per net ton. $20.00

Rivets

Structural rivets, Pittsburgh.. 2.75c to 3.00c
Rivets, 7/16-in. and smaller. ..... 65 and 10 to 65 and 5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank ..... $4.00 off list
Hot pressed square or hexagon tapped ..... $4.00 off list
Cold punched square or hexagon blank ..... 3.75 off list
Cold punched, square or hexagon, ... 3.75 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger. ..... 75 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller. 80 and 5 off
Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
(⅜ x 6 inches, smaller and shorter)

Rolled thread. ..... 60 and 5 off
Cut thread ..... 50, 10 and 5 off
Larger and longer. ..... 50, 10 and 5 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread ..... 60.10 and 5 off
Cut thread ..... 60 and 5 off
Larger and longer. ..... 60 and 5 off
(⅜ x 4 inches, cold punched nuts)
Cut thread ..... 50, 10 and 5 off
Larger and longer. ..... 50, 10 and 5 off
Lag screws ..... 65 and 5 off
Plow bolts Nos. 1, 2 and 3 heads. ..... 50 and 10 off
4 to 10 heads ..... 50-10 + 20 off
Stove bolts ..... 75, 10 and 5 off
Tap bolts ..... 25 and 10 off
Bolt ends with hot pressed nuts. ..... 60 and 5 off
Bolt ends with cold punched nuts. ..... 45, 10 and 5 off
Blank bolts ..... 60 and 5 off
Rough stud bolts with nuts ..... 50, 10 and 5 off

WASHERS

Wrought washers. ..... $5.00 to 5.10 off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

	Black	Galvanized
Butt Weld		
⅛ and ¼-inch	+11	+39
⅜-inch	22	2
½-inch	28	11
¾-inch	30	13
1 to 1½-inch		
Lap Weld		
1¼ and 1½-inch.	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 12-inch	28	13
	26	11

PLUGGED AND REAMED
Two points less than above

EXTRA STRONG, PLAIN ENDS

Butt Weld		
⅛ and ¼-inch	+19	+54
⅜-inch	21	7
½-inch	28	12
¾-inch	30	14
1 to 1½-inch.		
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch.	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)
(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch ..... 38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch ..... +22
1¾-inch ..... +12
2 and 2¼-inch ..... + 2
2½ to 3-inch 3
3¼ to 4½-inch 5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 43 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch ..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½ and 5-inch ..... 29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch ..... 35 off
4-inch ..... 39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

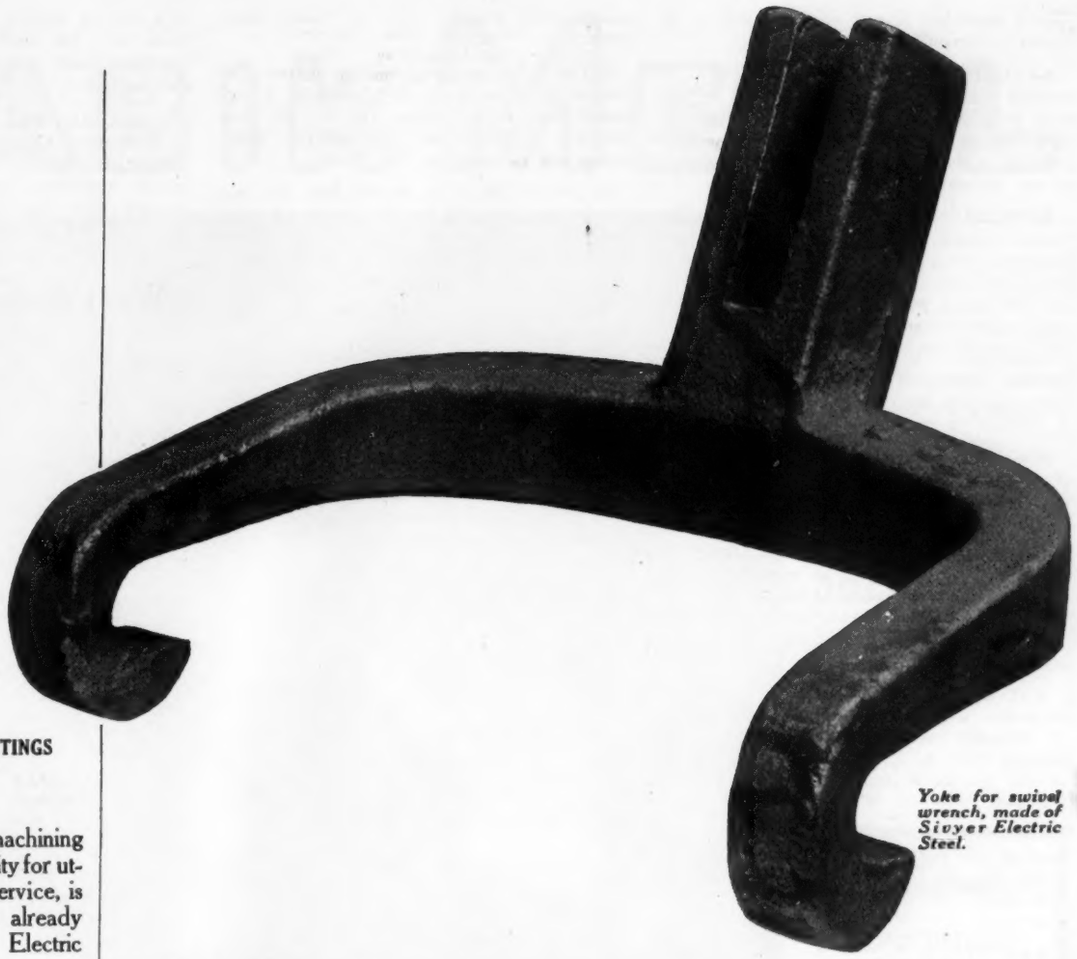
Base Discounts

Carbon, 0.10 to 0.20 per cent. ..... 83 off
Carbon, 0.30 to 0.40 per cent. ..... 81 off
Carbon, 0.40 to 0.50 per cent. ..... net price
Plus differentials and extras for cutting

SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES
(Effective April 19, 1923)

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅜-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.



Yoke for swivel wrench, made of Sivyer Electric Steel.

Replacing hammered forgings

GREAT strength and absolute soundness are the primary requisites for metal parts such as swivel wrenches. Because of their design, parts like the yoke have to be hammer forged or cast. In certain designs the hammer forging necessitates hot welding which may develop weakness in service. Manufacturers of machinery and tools, specializing in absolutely dependable equipment, are now having such parts cast in Sivyer Electric Steel. Its honest surfaces, trueness to pattern, and interior integrity provide the flawless quality and unfailing strength that men in the field demand.

SIVYER (S) CASTINGS

DEPENDABLE

The need for better machining qualities, and the necessity for utmost dependability in service, is rapidly extending the already wide use of Sivyer Electric Steel Castings.

Freedom from surface defects and from hidden interior flaws is assured by the same thorough molding practice that makes Sivyer Castings so uniformly true to pattern. Exceptional strength is provided by electric furnace metal produced according to the Sivyer standards of melting practice, analysis and control.

Send blue prints

We are especially interested in making experimental castings for manufacturers who are having trouble with hammered forgings. If you will send us your blue prints for such parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solutions without obligation on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

present standpipe, to cost about $40,000. J H Brahtz is consulting engineer.

KENOSHA, WIS.—Nash Motors Co. is starting work here on a 1-story, 190 x 600-foot, brick and steel addition to be equipped with loading docks, hoists, etc. A similar building is being completed by the company at its Milwaukee works.

KOHLER, WIS.—The Kohler Co., Sheboygan county, manufacturer of bath tubs, lavatories, etc., plans an enameling shop, 67 x 120 feet. Foundations are to be laid this fall for a packing room, 60 x 140 feet. Both additions are to cost about $100,000.

MADISON, WIS.—Schmidt Bros., 2611 Monroe street, will build a large garage and repairshop and have selected the firm of Balch & Lippert to prepare plans.

MADISON, WIS.—Dan Bilsie, proprietor of the Auto Service, has been granted a permit to build a $25,000 garage and repairshop at 812-814 East Washington avenue.

MADISON, WIS.—William H. Deason & Co. was successful bidder for erecting the new garage and machine shop of the Nash Service Station at 155 East Wilson street, to be 75 x 155 feet, partly two stories high, and costing about $45,000.

MADISON, WIS.—Bids have been closed on a new gas storage holder with a capacity of 3,000,000 cubic feet to be built by the Madison Gas & Electric Co., after approval of the board of appeals under the zoning ordinance.

MANITOWOC, WIS.—General contract has been let to Matt S. Dempsey, 1911 Marshall street, for the construction of a brick and steel foundry for the Grimm Aluminum Casting Co.

MARION, WIS.—F. H. Josslyn, Oshkosh, Wis., has organized the Marion Light & Power Co., with $25,000 capital, to build a transformer station and transmission lines from the High Falls hydroelectric station, to serve the community of Marion.

MARKESAN, WIS.—William Dehn will build a $30,000 garage with repair shop. General contract was let to the Oshkosh Construction Co., Oshkosh, Wis.

MILWAUKEE—The Prime Mfg. Co. is considering the construction of a brass foundry.

MILWAUKEE—Contracts have been let by the Concrete Specialty Mfg. Co. for a new plant, 110 x 132 feet, costing $50,000, at Lake street and Humboldt avenue.

MILWAUKEE—Roman Klapinski will build a $25,000 garage and repair shop at Eighth avenue and Mitchell street. Building contracts have been let.

MILWAUKEE—Bids are in for the construction of a 4-story 100x150-foot concrete and brick building for the International Harvester Co. at Reed and South Water streets.

MILWAUKEE—Plans will be completed soon for a complete new machine shop on a new site for the Hoyer Engineering Co., now located at 281 Grove street.

MILWAUKEE—The Carbon Engineering Co. was incorporated for $20,000 to manufacture carbon brushes and similar specialties for the electrical industry.

MILWAUKEE—The Roberts Brass Co. has been granted a permit to build a $20,000 addition to its foundry and machine shop at Lincoln avenue and Alexander street. W. A. Krahn has the general contract.

MILWAUKEE—Plans for the construction of a 1-story brick and steel casting shop addition, 50 x 80 feet, have been completed by the Milwaukee Steel Foundry Co., 127 South Water street.

MILWAUKEE.—The Luick Ice Cream Co., interest of Armour & Co., plans a 4-story garage and repair shop, 120 x 120 feet. Architect Leenhouts & Guthrie, 422 Jefferson street, is preparing the plans.

MILWAUKEE.—The Wocho Mfg. Co. was incorporated for $30,000 by E. J. Cunningham, C. G. Ortmayer and A. E. Welch with offices at 8-10 Grand avenue, to manufacture machinery to repair milk cans.

MILWAUKEE—The Thurner Heat Treating Co., 126 Ferry street, has been incorporated under the laws of Wisconsin with $50,000 capital. Rudolph Thurner, founder of the business, and William B. Schroer, manager of the plant, are the sole owners.

MILWAUKEE—The Harry E. Weber Co., conducting the Stewart-Warner Service Station at 582 Jefferson street, has purchased the site at Van Buren and Martin streets and will build a 1-story fireproof store and shop, 120 x 128 feet.

MILWAUKEE—The common council is favorable toward request of department of public works to build a $100,000 garage and service building at Sixteenth and Canal streets to consolidate all service on municipal motor vehicles.

MILWAUKEE—The Milwaukee Electric Railway & Light Co. is taking bids on the erection of a garage and repair shop, 60 x 110 feet, for motorbus equipment, adjacent to the Cold Spring avenue car shops at Fortieth street.

MILWAUKEE—The Dahlman Construction Co., Majestic building, has been awarded the contract to build a $75,000 power plant for the Pittsburgh Plate Glass Co., for the $2,000,000 paint and varnish works and research laboratories now under construction at 213 Lake street, Milwaukee.

MILWAUKEE.—The common council is considering a $100,000 central station for the care and repair of all municipal motor vehicles at the city yards at Sixteenth and Canal streets. A number of machine tools and other shop machinery will be needed, if request is approved.

MILWAUKEE.—Koehring Co., manufacturer of gas and steam powered paving machinery, concrete mixers, hoists, etc., plans a 1-story, 120 x 360-foot addition. William J. Koehring is president and general manager. Architect is Van Ryn & DeGelleke, Caswell block.

MILWAUKEE—Jolite Co., Inc., and Jolite Tool Co. are the names of two new incorporations organized by Dean R. Williams, Cyrus L. Cole and George M. Wolff, members of Williams, Cole & Wolff, manufacturers' agent, 610 Sycamore street. The former concern will manufacture high-speed steels and the other will design and make tools.

NEENAH, WIS.—Contracts have been let by the J. W. Hewitt Machine Co. for a one-story shop addition which will cost about $25,000.

NEW LONDON, WIS.—Architects Smith, Reynolds & Brandt of Manitowoc, Wis., have been selected to prepare plans and superintend the erection of a new high school with manual training departments, to be built next fall and winter at a cost of $250,000.

NORTH MILWAUKEE, WIS.—Bids are being taken on a side addition to the plant of the North Milwaukee Foundry Co.

NORTH MILWAUKEE—W. P. Schwartzburg will build a shop addition to his garage at a cost of $20,000. The extension will be 60x80 feet. The Coddington Engineering Corp., 290 Third street, Milwaukee, has taken the general contract.

OSHKOSH, WIS.—George C. Hume and Peter Enders, Chilton, Wis., patentees of a sanitary hospital bed with special lifting and moving apparatus, have contracted with the Triangle Mfg. Co., Oshkosh, to manufacture the article. Some new machinery will be purchased.

West of the Mississippi

LOS ANGELES—Ajax Steel & Tank Works was incorporated with capital stock of $200,000 and 2000 shares stock subscribed at $300 per share.

SAN FRANCISCO—Arrangements have been made for the manufacture of a new type of metal coupler by the American Quick Coupling Co., Robert Dollar building.

BELLINGHAM, WASH.—Bellingham Steel & Forge Co. has been incorporated for $30,000 by Fred W. Neal, B. E. Shellebarger, T. Shellbarger and Dan Erickson.

Business in Canada

ST. BONIFACE, MAN.—The Dominion Tar & Chemical Co., Ltd., will establish a factory here at a cost of $250,000. O. P. Walsh is vice president and general manager of the company which is a subsidiary of Burt, Boulton & Haywood, Ltd., of London, England.

MONCTON, N. B.—The Morrow Mfg. Co., has been formed to acquire and take over the business and plant of the W. L. Morrow & Co., here, and is erecting a 2-story and basement brick building at a cost of $10,000 for the manufacture of carriages, vehicles, etc. The company will require equipment for forge shop, etc.

DUNDAS, ONT.—Haustine Co., Ltd., manufacturer of sewage disposal systems, septic tanks, drinking fountains, etc., is building an addition to its plant with the intention of doubling the present capacity. It is expected that the building will be finished and equipment installed by the first of the year.

HAMILTON, ONT.—Canadian Westinghouse Co., has let the contract to W. H. Yates Construction Co., 17 Main Street East, Hamilton, Ont., for foundation work for foundry to be erected on Aberdeen Street. B. H. Prack, Main Street East, is architect.

TORONTO, ONT.—Castle-Trethewey Mines, Ltd., Standard Bank building, plans to construct a 100-ton mill at Gowganda, Ont., and will be in the market for complete equipment for milling plant.

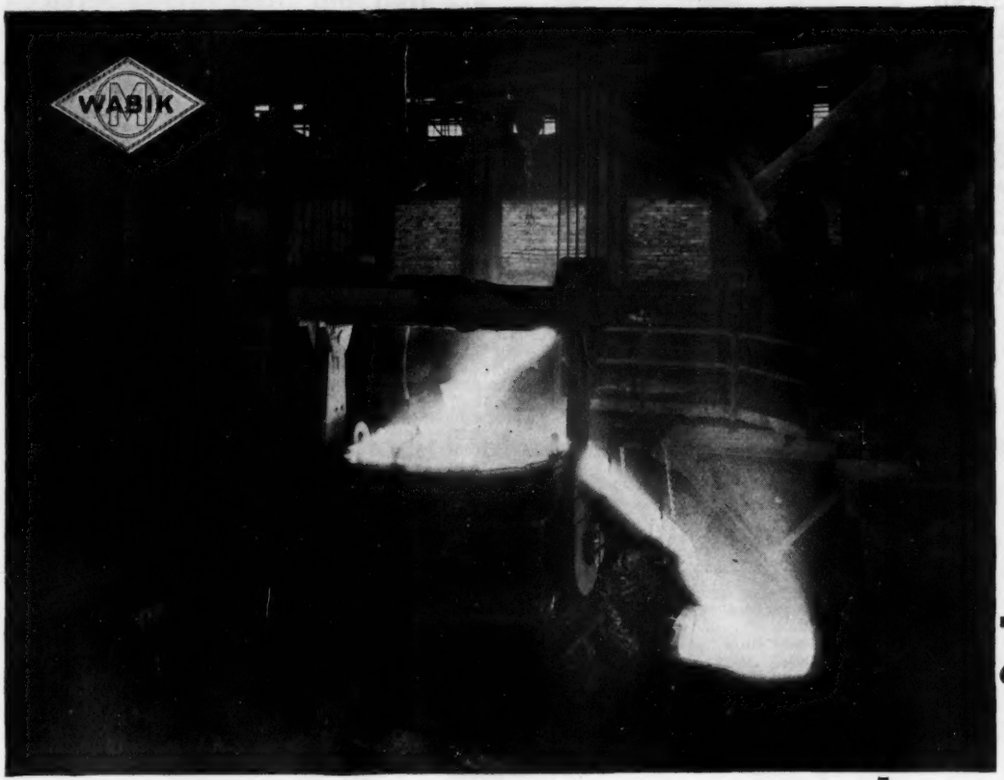
TORONTO, ONT.—Goulston & Co., Ltd., has been incorporated for $40,000 to manufacture and deal in metal furniture, railway fixtures and appliances and machinery by Edgar W. White, William E. Johnson and James W. Bradshaw.

WELLAND, ONT.—W. G. Somerville & Son, 36 Main Street North, has let the general contract for erection of garage and repair shop to William Mitchell, Welland, to cost $40,000.

WINDSOR, ONT.—The Universal Oil Burner Co., Ltd., has been incorporated for $40,000 to manufacture oil burners by Norman A. McLarty, Albert Eastman and Mary Cooke.

MONTREAL, QUE.—Mount Royal Metal Co., Ltd., has been incorporated for $100,000 to carry on business of brass and iron founder, engineer and manufacturer of metals, by John E. Grivell, Frederick J. Powers and Helena A. Peers.

WABIK METAL



"Tapping" an 80 ton heat of "Wabik" metal, showing overflow of slag running into slag box.

SHEET BARS INGOTS

WABIK METAL IS
A Special Material, Specially Treated
for
VITREOUS ENAMELING

STOVE DOOR PANELS: SPLASHER BACKS: BROILER PANS: TABLE TOPS: REFRIGERATORS: SIGNS: and other flat work.

WABIK METAL SHEETS, like all other "Mansfield" Products, are rolled from our own *"Bottom-poured"* Ingots.

They are very low in sulphur.

Other Specialties:

AUTOMOBILE SHEETS

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS
PICKLED and ANNEALED
ENAMELING STOCK
For Kitchen Utensils
MILK CAN STOCK

"Mansfield" Steel is the ultimate in Sheet Bars and in Sheets. It means satisfaction to the many users. Constant study of the needs of users, and continuous application of the results of such study, in the way of improved methods in our plants has established a reputation for reliability unsurpassed.

SHEET BARS INGOTS

MANSFIELD SHEET & TIN PLATE COMPANY
MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

The L. D. Rockwell Co., No 2 Rector St., New York, N. Y.
Mr. D. B. Coey, 1018 Standard Oil Building, Chicago, Ill.
Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.
The L. D. Rockwell Co., 1201 National Bank Building, Cleveland, O.
Walter G. Clark, Inc., 106 N. Third St., St. Louis, Mo.
Walter G. Clark, Inc., 313 American Bank Bldg., Kansas City, Mo.
Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ont., Canada.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D. C.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Bldg., Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.00 to 15.00
Boston (dealers)	10.00 to 10.50
Buffalo	16.00 to 17.00
Chicago	14.50 to 15.00
Cleveland	14.75 to 15.25
Cincinnati	12.50 to 13.00
Detroit (dealers)	12.50 to 13.00
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	11.00 to 11.50
Pittsburgh (dealers)	16.00 to 16.25
St. Louis	14.25 to 14.75
Valleys (nominal)	16.50
No. 1 railroad steel New York (dealers)	12.00 to 12.50

BUNDLED SHEETS

Buffalo	$15.00 to 15.50
Cleveland	11.00 to 11.25
Cincinnati	9.00 to 9.50
Detroit	8.00 to 8.50
Eastern Pennsylvania	11.00
Pittsburgh	13.00 to 13.50
St. Louis	8.00 to 8.50
Valleys	11.00 to 11.50

STEEL RAILS, SHORT

Birmingham	16.00 to 17.00
Boston (dealers)	11.50 to 12.00
Chicago	17.50 to 18.00
Cincinnati	18.50 to 19.00
Cleveland	14.00 to 14.50
St. Louis	17.00 to 18.00

STOVE PLATE

Birmingham	16.00 to 17.00
Boston (consumers)	16.50 to 17.00
Buffalo	17.00 to 17.50
Chicago	18.00 to 18.50
Cincinnati (net ton)	9.00 to 9.50
Cleveland	15.00 to 15.50
Detroit (net ton) (dealers)	10.50 to 11.00
Eastern Pennsylcania	16.50 to 17.00
New York (dealers)	14.00 to 14.50
Pittsburgh	14.50 to 15.00
St. Louis	15.50 to 16.00

LOW PHOSPHORUS

Buffalo	21.00 to 22.00
Cincinnati	14.00 to 14.50
Eastern Pennsylvania	21.00 to 22.00
Pitts. billets and bloom crops.	22.00 to 22.50

SHOVELING STEEL

Chicago	14.00 to 14.50
Pittsburgh	13.00 to 13.50
St. Louis	14.25 to 14.75

KNUCKLES, COUPLERS & SPRINGS

Chicago	19.50 to 20.00
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh	19.50 to 20.00
St. Louis	17.00 to 17.50

COMPRESSED SHEETS

Buffalo	14.00 to 15.00
Chicago	11.00 to 11.50
Cleveland	13.00 to 13.25
Detroit (dealers)	9.50 to 10.00
Pittsburgh	14.50 to 15.00
Valleys	14.50

FROGS, SWITCHES, GUARDS

Chicago	14.50 to 15.00
Eastern Pennsylvania	15.00
St. Louis	13.50 to 14.00

BOILER PLATE, CUT

St. Louis	8.50 to 9.00

ANGLE BARS—STEEL

Chicago	16.50 to 17.00
St. Louis	16.00 to 16.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	14.00 to 15.00
Boston (dealers)	13.00 to 13.50
Buffalo	15.00 to 16.00
Cleveland, No. 1	12.00 to 12.50
Chicago, No. 1	15.25 to 15.75
Chicago, No. 2	14.50 to 15.00
Cincinnati, No. 1	12.00 to 12.50
Detroit, No. 2	12.00 to 12.50
Eastern Pennsylvania	17.50 to 18.00
Pittsburgh, No. 1	14.50 to 15.00
Pittsburgh, No. 2	16.00 to 16.25
New York, No. 1 (dealers)	15.50 to 16.50
St. Louis, No. 1	15.00 to 15.50
St. Louis, No. 2	14.75 to 15.25

WROUGHT PIPE

Boston (dealers)	10.50 to 11.00
Buffalo	13.00 to 14.00
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	10.50 to 11.00

YARD WROUGHT

Boston	11.50 to 12.00
Eastern Pennsylvania	15.00 to 16.00

CITY WROUGHT

New York, long	14.50 to 15.00

BUSHELING

Buffalo	14.50 to 15.50
Chicago, No. 1	12.25 to 12.75
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1	10.50 to 11.00
Cleveland, No. 1	10.50 to 10.75
Cleveland, No. 2	8.00 to 8.50
Detroit, No. 1	10.50 to 11.00
Detroit, No. 2 (new)	9.50 to 10.00
Detroit, No. 2 (old)	8.00 to 8.50
Eastern Pennsylvania	14.50 to 15.00
Pittsburgh, No. 1	14.00 to 14.50
St. Louis No. 1	14.00 to 14.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston (dealers)	7.00 to 7.50
Buffalo	9.00 to 10.00
Chicago	7.50 to 8.00
Cleveland	11.00 to 11.25
Cincinnati	8.00 to 8.50
Detroit (dealers)	7.50 to 8.00
Eastern Pennsylvania	10.50 to 11.50
New York (dealers)	7.00 to 7.50
Pittsburgh	12.00 to 12.50
St. Louis	8.00 to 8.50
Valleys	11.00

CAST IRON BORINGS

Birmingham (chemical)	18.00 to 19.00
Birmingham (plain)	9.00 to 10.00
Boston (chemical)	9.00 to 10.00
Boston (dealers)	8.00 to 8.50
Buffalo	13.00 to 14.00
Pittsburgh	13.50 to 14.00
Chicago	10.50 to 11.00
Cincinnati	9.00 to 9.50
Cleveland	11.50 to 12.00
Detroit (dealers)	10.00 to 10.50
Eastern Pennsylvania	12.50 to 13.00
Eastern Pennsylvania	16.00 to 17.00
New York (dealers' price)	8.50 to 9.50
St. Louis	11.50 to 12.00
Valleys	13.25 to 13.50

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	6.00 to 6.50
Cleveland	11.00 to 11.25
Detroit (dealers)	9.50 to 10.00
Eastern Pennsylvania	10.00 to 12.00
New York (dealers)	7.00 to 7.50

IRON AXLES

Birmingham	23.00 to 24.00
Boston (consumers)	31.00 to 32.00
Buffalo	28.00
Chicago	28.75 to 29.25
Cincinnati	23.00 to 23.50
Eastern Pennsylvania	30.00 to 33.00
New York (dealers)	27.00 to 28.00
St. Louis	27.00 to 27.50

IRON RAILS

Buffalo	19.00 to 20.00
Chicago	19.50 to 20.00
Cincinnati	13.50 to 14.00
St. Louis	15.50 to 16.00

PIPES AND FLUES

Chicago	8.50 to 9.00
Cincinnati	9.00 to 9.50
Cleveland	9.50 to 10.00
St. Louis	8.50 to 9.00

RAILROAD GRATE BARS

Buffalo	16.00 to 17.00
Chicago	15.75 to 16.25
Cleveland	15.00 to 15.50
Eastern Pennsylvania	16.00
New York (dealers)	14.00 to 14.50
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	9.00 to 9.50
Chicago, small	9.50 to 10.00
Cleveland, small	11.00 to 11.25
Cleveland, large	11.00 to 11.25
Detroit (dealers)	9.50 to 10.00

FORGE SCRAP

Boston (dealers)	8.50 to 9.00
Chicago	14.50 to 15.00
Eastern Pennsylvania	12.50 to 13.00

ARCH BARS AND TRANSOMS

Chicago	21.00 to 21.50
St Louis	20.00 to 20.50

ANGLE BARS—IRON

Chicago	22.00 to 22.50
St. Louis	19.75 to 20.25

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	9.00 to 9.50
Buffalo	14.00 to 14.50
Chicago	11.50 to 12.00
Cleveland	12.00 to 12.25
Eastern Pennsylvania	13.50 to 14.50
Pittsburgh	14.00 to 14.50
St. Louis	11.00 to 11.50

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Boston (consumers)	22.00 to 23.00
Buffalo	18.00 to 19.00
Chicago	18.50 to 19.00
Cleveland	19.00 to 19.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	nominal
Pittsburgh	19.00 to 19.50
St. Louis	19.00 to 19.50

SHAFTING

Boston (consumers)	22.00 to 23.00
Chicago	21.00 to 21.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	16.00 to 17.00
St. Louis	19.00 to 19.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	18.00 to 19.00
Birmingham, iron	17.00 to 18.00
Boston (consumers)	22.00 to 23.00
Buffalo, iron	15.50 to 16.50
Chicago, iron	18.50 to 19.00
Cincinnati	13.00 to 13.50
Eastern Pennsylvania	19.50 to 20.50
New York iron (dealers)	16.00 to 17.00
Pittsburgh, iron	18.00 to 18.50
Pittsburgh steel	19.50 to 20.00
St. Louis, iron	18.00 to 18.50

NO. 1 CAST SCRAP

Birmingham, cupola	19.00 to 20.00
Boston (consumers)	22.50 to 23.00
Buffalo	19.50 to 20.50
Chicago, cupola	20.50 to 21.00
Cincinnati No. 1 machinery cupola (net tons)	19.00 to 19.50
Cleveland, cupola	20.00 to 21.00
Detroit (net ton) (dealers)	16.50 to 17.00
Eastern Pennsylvania, cupola	19.00 to 20.00
New York, cupola (dealers)	17.00 to 17.50
Pittsburgh, cupola	19.00 to 19.50
San Francisco	28.00
St. Louis, railroad	20.50 to 21.00
St. Louis, agricultural	20.50 to 21.00
Valleys	19.50 to 20.00

HEAVY CAST

Boston (consumers)	20.00 to 21.00
Buffalo	14.00 to 15.00
Cleveland	13.00 to 13.50
Detroit (automobile) (net ton)	22.00 to 22.50
Eastern Pennsylvania	18.00 to 19.00
New York (dealers)	16.00 to 16.50
Pittsburgh	16.00 to 16.50

MALLEABLE

Boston (railroad) (consumers)	20.00 to 21.00
Buffalo	17.00 to 18.00
Chicago, railroad	20.00 to 20.50
Chicago, agricultural	19.00 to 19.50
Cincinnati, agricultural	14.00 to 14.50
Cincinnati, railroad	15.00 to 15.50
Cleveland, agricultural	19.00 to 20.00
Cleveland, railroad	20.00 to 20.25
Detroit (dealers)	19.50 to 20.00
Eastern Pennsylvania, railroad	16.50 to 17.00
Pittsburgh, railroad	19.50 to 20.00
St. Louis, agricultural	17.00 to 17.50
St. Louis, railroad	17.00 to 17.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	17.00 to 17.50
Boston (dealers)	12.00 to 12.50
Chicago	16.00 to 16.50
Cleveland	18.00 to 18.25
Detroit	12.00 to 12.50
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	15.00 to 15.50
Pittsburgh district	17.50 to 18.00
St. Louis	14.50 to 15.00

LOCOMOTIVE TIRES

Chicago	16.75 to 17.25
St. Louis	16.00 to 16.50

LOW PHOSPHORUS PUNCHINGS

Chicago	16.00 to 16.50
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh	20.00 to 20.50

LOGEMANN

Double Ram Hydraulic

Scrap-Metal Presses

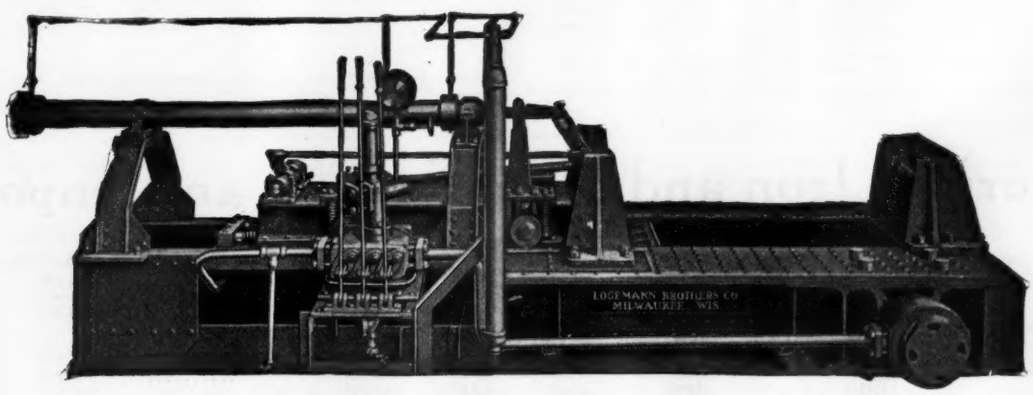
STANDARD

In Hundreds of Mills, Yards and Plants

Hydraulic-compressed scrap always commands the best prices. It is more conveniently stored—more economically handled—there is less loss from corrosion—less heat is required for remelting.

Loose Scrap is worth almost nothing.
Compare this with prices paid for "hydraulic-compressed."

LOGEMANN BROTHERS CO., 3126 Burleigh St. MILWAUKEE, WIS.



We build Balers for All Purposes

Hand-balers for waste-paper, power and hydraulic balers for the textile trades, hydraulic presses for metal and waste trades.

Also Hydraulic Shaft Straighteners, Etc.

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxembourg
Monthly average 1912.	729,000	405,000	192,000	184,800
Monthly average 1913.	855,000	427,000	203,800	209,000
Monthly average 1919.	617,000	198,000	20,600	50,000
Monthly average 1920.	669,500	281,700	92,700	58,000
Monthly average 1921.	217,600	280,300	71,800	79,600
Monthly average 1922.	403,300	428,900	131,500	137,500
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	421,400	125,200	147,800
August	411,700	440,400	151,500	147,800
September	430,300	454,600	160,600	149,400
October	481,500	495,600	172,000	162,600
November	493,900	505,500	169,600	151,300
December	533,700	506,200	157,900	156,700
1923				
January	567,900	478,600	157,800	139,500
February	543,400	300,800	149,000	86,500
March	633,600	311,200	167,300	93,900
April	652,200	345,000	169,600	94,400
May	714,200	387,300	163,500	84,300
June	692,900	440,000	169,300	88,400
July	655,100	.....	.....	.....

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxembourg
Monthly average 1912.	566,000	363,000	206,000	79,400
Monthly average 1913.	639,000	385,000	202,300	109,000
Monthly average 1919.	658,000	179,000	27,400	32,000
Monthly average 1920.	755,600	250,200	101,300	49,000
Monthly average 1921.	302,100	254,500	65,000	62,300
Monthly average 1922.	486,000	372,000	128,200	114,000
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	116,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	362,900	112,500	125,600
August	528,400	390,300	149,100	129,200
September	555,900	400,300	154,900	132,600
October	565,201	423,000	179,600	136,800
November	600,800	404,100	174,600	130,200
December	546,100	408,100	166,700	131,600
1923				
January	634,100	401,400	159,800	121,500
February	707,100	285,300	154,700	72,400
March	802,500	810,900	181,100	78,500
April	749,400	349,200	167,700	77,600
May	821,000	387,300	169,100	72,300
June	767,700	420,700	186,000	73,200
July	624,300	.....	.....	.....

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912.	166,400	16,400	87,000	27,300
Average monthly 1913.	185,900	12,900	68,900	25,000
Average monthly 1919.	42,400	113,100	44,400	.....
Average monthly 1920.	92,400	89,000	67,000	26,200
Average monthly 1921.	137,100	38,500	43,300	.....
Average monthly 1922.	73,500	64,300	42,000	199,000
1922				
January	88,700	36,600	}	68,200
February	64,600	55,800	} 139,000	66,900
March	63,800	67,300	}	105,700
April	59,900	89,100	32,400	129,000
May	60,900	41,100	} 62,400	154,300
June	52,800	73,200	}	137,700
July	55,900	54,800	}	182,900
August	80,100	40,300	} 129,700	181,800
September	70,600	50,000	}	175,000
October	90,600	109,200	}	233,800
November	79,800	58,500	} 140,000	186,700
December	114,000	109,500	}	239,600
1923				
January	128,900	55,800	45,100	191,300
February	122,700	63,800	40,000	82,500
March	111,000	38,000	35,200	93,200
April	115,400	44,200	32,800	143,900
May	82,200	37,000	39,600	127,400
June	105,100	55,700	.....	.....
July	114,100	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912.	400,600	41,500	124,500	482,400
Average monthly 1913.	414,100	48,200	128,800	516,900
Average monthly 1919.	186,100	19,400	14,500	.....
Average monthly 1920.	270,900	74,600	74,300	143,600
Average monthly 1921.	141,700	132,700	75,900	176,000
Average monthly 1922.	283,400	164,000	143,000	209,700
1922				
January	235,300	164,000	}	218,200
February	223,400	107,000	} 198,400	170,000
March	295,800	72,300	}	208,700
April	258,400	125,800	83,900	195,500
May	272,400	122,200	} 279,600	204,500
June	236,300	180,300	}	209,132
July	251,700	182,100	}	206,200
August	270,000	168,400	} 522,600	181,300
September	279,200	174,000	}	223,500
October	347,100	235,600	}	229,908
November	372,300	181,300	} 631,200	210,000
December	114,000	221,700	}	258,900
1923				
January	353,400	158,500	202,200	212,900
February	317,600	236,500	162,200	183,500
March	368,100	139,200	200,000	115,100
April	387,000	120,600	192,000	105,100
May	424,500	40,000	184,500	91,700
June	365,100	.....	.....	.....
July	307,700	.....	.....	.....

Note—Belgian figures include Luxembourg since May 1, 1922.

Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1923		
June	67,968	176,523
May	75,840	195,535
April	77,894	183,905
March	106,050	168,176
February	67,682	135,046
January	119,955	134,441
1922		
December	96,358	154,087
November	152,250	124,004
October	184,202	131,542
September	76,393	128,370
August	49,054	144,264
July	62,426	157,027
June	39,154	216,298
May	23,098	229,616
April	18,720	197,562
March	12,774	206,474
February	11,535	133,333
January	13,404	155,962
Total	643,010	1,988,539
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	516,447
Total	117,105	2,156,818
1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
1919	327,490	4,405,281
1918	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687